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PROCEEDINGS

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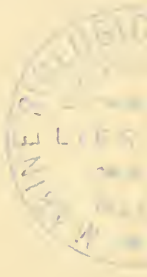

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For 1913

(ELECTED DECEMBER 14, 1912)

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 P. M.

January 11, 1913—505th Meeting.

President E. W. Nelson in the chair and 54 persons present.

The President appointed the following standing committees:

On Communications—Paul Bartsch, Edwin Kirk, Lewis Radcliffe, A. D. Hopkins, C. V. Piper.

On Publications—W. P. Hay, N. Hollister, J. W. Gidley.

C. V. Piper exhibited a wooden vase covered with a veneer of "silkwood." This wood is cut from a large Polyporus fungus.

A. S. Hitchcock reported his recent return from a successful collecting trip in Jamaica, Trinidad and Tobago.

President Nelson reported a recent trip after mammals to the Grand Canyon of the Colorado.

The following communications were presented:

"The Rediscovery of *Œnothera grandiflora*": S. M. Tracy.

"The Problem of the Identity of *Œnothera Lamarckiana*": H. H. Bartlett.

"Saw-flies in their Relation to Forestry": S. A. Rohwer.

January 25, 1913—506th Meeting.

President Nelson in the chair and 47 persons present.

Paul Bartsch exhibited a small photographic camera with specimens of its work and enlargements.

Barton W. Evermann reported the receipt of a wireless message from Agent Lembkey at the Pribilof Islands stating that the reindeer herds on the islands are in excellent condition at the end of the first year.

The following communications were presented:

"Notes on the Biology of the Common Termites of the Eastern United States": Thomas E. Snyder.

"The Biting Powers of Ants": W. L. McAtee.

February 8, 1913—507th Meeting.

President Nelson in the chair and 57 persons present.

The evening was devoted to a lecture by Dr. Burt G. Wilder, on "The Brain as a Guide to the Affinities of Vertebrates."

The communication was discussed by Hugh M. Smith and Theodore Gill.

February 22, 1913—508th Meeting.

President Nelson in the chair and 76 persons present.

The program consisted of an illustrated lecture on "Hunting with Rainey in Africa," by Edmund Heller.

March 8, 1913—509th Meeting.

Vice-President Bartsch in the chair and 37 persons present.

William Palmer exhibited the head and the plaster cast of the head of the small devil ray *Mobula olfersi* and explained the feeding habits of this species.

Theodore Gill made some remarks on the history of rays.

Barton W. Evermann reported that excellent prices had been received for the blue fox skins from the Pribilof Islands sold at Lampson's March sale, in London.

The following communications were presented:

"Remains of a Camel found in America north of the Arctic Circle": J. W. Gidley.

"Remarkable Philippine Mollusks obtained by the U. S. Bureau of Fisheries Expedition": Paul Bartsch.

March 22, 1913—510th Meeting.

Vice-President Bartsch in the chair and 52 persons present.

Barton W. Evermann reported the recent executive order of President Taft setting apart the Aleutian Islands as a wild animal and bird reservation.

A. D. Hopkins announced the recent organization of "The Society for the Advancement of Forest Entomology in America."

The following communications were presented:

"Recent Progress in the Study and Culture of the Common Eel": Hugh M. Smith.

"Tree Shrews": Marcus W. Lyon, Jr.*

April 5, 1913—511th Meeting.

President Nelson in the chair and 43 persons present.

Paul Bartsch reported observations on the notes of the common toads of this vicinity—*Bufo americana* and *Bufo fowleri*.

Henry Talbott made some remarks on the probable agency of man in the dispersion of animals during geologic history.

The following communications were presented:

"A Commercial Aspect of Paleontology, by a Layman": Henry Talbott.

"Zoological Results of the Danish Expedition to Northeast Greenland": Fritz Johansen.

April 19, 1913—512th Meeting.

Vice-President Hay in the chair and 30 persons present.

Henry Talbott exhibited teeth of the fossil shark *Carcharodon megalodon* from South Carolina.

W. W. Cooke made some remarks on the spring migration of birds during the present season.

The following communication was presented:

"Stock Poisoning by Larkspur": C. D. Marsh.

May 5, 1913—513th Meeting.

President Nelson in the chair and 56 persons present.

Hugh M. Smith exhibited pictures of a whale shark captured in Florida waters during the present year.

*Abstract of a paper in Proceedings of U. S. Nat. Museum, Vol. 45, pp. 1–188, 11 plates, 1913.

The following communications were presented:

"The Remarkable Extinct Fauna of Southern California Revealed in the Asphalt Deposits Near Los Angeles": C. Hart Merriam.

"Notes on the Big Bears of North America": C. Hart Merriam.

"Distribution of Game Animals in Africa": Edmund Heller.

October 18, 1913—514th Meeting.

Past President Howard in the chair and 61 persons present.

The following communications were presented:

"The Federal Migratory Bird Regulations and their Assistance in the Conservation of Bird Life in America": T. S. Palmer.

"The Breeding of the Loggerhead Turtle": W. P. Hay.

"The First Year's Results in Breeding Some Bahama Shells (*Cerion*) on the Florida Keys": Paul Bartsch.

November 1, 1913—515th Meeting.

President Nelson in the chair and 46 persons present.

C. D. Marsh reported an interesting habit of the bull snake in Montana.

The following communications were presented:

"Depredations by Forest Insects and their Control": A. D. Hopkins.

"Dredging at Chincoteague, Va.": Paul Bartsch.

November 15, 1913—516th Meeting.

Vice-President Bartsch in the chair and 35 persons present.

The following communications were presented:

"The Physiology of the Blueberry": F. V. Coville.

"Breeding Pigeons for Color Inheritance": Leon J. Cole.

November 29, 1913—517th Meeting.

President Nelson in the chair and 63 persons present.

C. A. Davis exhibited the carbone of a whale, supposed to be that of the sulphur-bottom species.

H. E. Van Deman exhibited specimens of the "Delicious" apple, and gave a short history of this variety.

The program was a discussion of "Parallel Development." It was opened by A. D. Hopkins with a paper on "Parallel Development as illustrated in Morphological Characters and Physiological Characteristics in Scolytoid Beetles." Messrs. Nelson, Oberholser, Lyon, Gidley, Hay, Baker, Bartsch and Gill took part in the discussion.

December 13, 1913—518th Meeting.

THIRTY-FOURTH ANNUAL MEETING.

President Nelson in the chair and 28 persons present.

Reports of the various officers were received.

The following officers were elected for the year 1914:

President: Paul Bartsch.

Vice-Presidents: W. P. Hay, J. N. Rose, A. D. Hopkins, Mary J. Rathbun.

Recording Secretary: D. E. Lantz.

Corresponding Secretary: W. L. McAtee.

Treasurer: Wells W. Cooke.

Members of the Council: William Palmer, Hugh M. Smith, Vernon Bailey, Marcus W. Lyon, Jr., N. Hollister.

President Bartsch was selected to represent the Society as Vice-President in the Washington Academy of Sciences.

The president announced the following standing Committee on Publications: N. Hollister, W. L. McAtee, Wells W. Cooke.

Vol. XXVI, pp. 1-4 January 18, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW POLECATS RELATED TO *MUSTELA LARVATA*.

BY N. HOLLISTER.

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The polecats now referred to *Mustela* (*Putorius*) *larvata* are divisible into at least three well marked forms, which, in the absence of intermediate specimens, may be called species. The great variations in color exhibited by the series in the United States National Museum prove to be geographic, not individual, and in the two cases where there are three skins from one locality the specimens are remarkably uniform in color and markings. The animal is rare in collections and, unfortunately, we have no specimen from the type locality of *larvata*, southwestern Tibet, near the border of Nepal. The good description of the original specimen of that form, supplemented by the remarks on an additional example by Horsfield (Cat. Mamm. Mus. East India Co., pp. 105–106) shows it to be of a decidedly different color from either of the new forms described in this paper. Mr. Thomas has recently expressed the opinion that Kastschenko's *Putorius eversmanni michnoi* is a form of *larvata* rather than of *eversmanni* (Ann. and Mag. Nat. Hist., IX, p. 393, April, 1912). From a study of the description,* with specimens from various localities before me, I find it agrees better with a Siberian specimen of *eversmanni* than with any specimen of the *larvata* group in the National Museum. Some specimens of the two animals are, however, superficially much alike, and mutilated trappers' skins without skulls might readily be confused. Only a direct comparison can settle the

* Ann. Mus. Zool., St. Petersburg, XV, No. 3, p. 271, 1910.

question, but *michnoi* is at any rate a different animal from either of the forms here described.

Mustela lineiventer sp. nov.

Type from Tchegan-Burgazi Pass, Little Altai, Siberia; 9000 feet. United States National Museum No. 175,440, ♂ adult, skin and skull. Collected July 10, 1912, by N. Hollister. Orig. No. 4281.

General characters.—A polecat related to *larvata*, with light colored head; tail with black only on tip; and underparts with pectoral and inguinal black areas connected by only a narrow median stripe of light brown, the middle underparts of body otherwise clear cream-buff.

Color of type.—Ring around nose pad, lips, chin, upper throat, cheeks, and area between eye and ear white, very slightly mixed with brownish. Ring around eyes, mask across forehead, and tufts in front of ears dark bister. Top of head drab-gray (mixed white, buff and gray); nape and upper back between shoulders rich golden-buff, then paler buff (with more mixture of white); lower back with long black-tipped overlying hairs. Tail brownish-buff above and below, with bushy black tip. Lower throat, breast, arms to shoulders, anal and inguinal regions, and legs to hips pure black; the two areas of black connected by a narrow median line of brownish. Rest of underparts and sides forward buffy-white.

Measurements of type and two topotypes, all fully adult:

	♂ type 175,440 mm.	♂ 175,441 mm.	♀ 175,439 mm.
Head and body	480	440	410
Tail vertebræ	170	168	170
Hind foot, without claws	72	63	61
SKULLS			
Condylobasal length	75.5	70.2	69.4
Zygomatic breadth	47	46.6	41
Least postorbital breadth	12.5	12.6	11.2
Upper molar-premolar row	17.7	17.4	17.8
Length of mandible	48.7	44.9	43.3
Lower molar-premolar row	22.6	21.0	21.5

Mustela tiarata sp. nov.

Type from Chiu-ning-chow, 150 miles east of Lanchow, Kansu, China; 5500 feet. United States National Museum No. 155,160, skin and skull of immature ♂ (permanent dentition in place but basal and nasal sutures open). Collected July 24, 1909, by Arthur de C. Sowerby. Orig. No. 196.

General characters.—A *larvata*-like polecat with face and top of head dark bister, the mask very faintly defined or entirely obscured owing to the uniformity of color. Tail with basal third brown, terminal two-thirds

black. Underparts with pectoral and inguinal areas of black connected by a median stripe of blackish, the middle underparts of body otherwise griseous.

Color of type.—Ring around nose pad, lips, and chin pure white; between eye and ear gray; rest of face, including ring around eye, base of ear, and top of head, dark bistre. Ears, except at base, pure white. Back of head, nape, and forward half of back uniform dark tawny-olive; posterior half of back with long overlying hairs with black ends. Tail at base brown, the terminal two-thirds black. Throat, breast, arms to shoulders, anal region, groin, and legs pure black; the two black areas connected by a narrow grayish-black band; rest of underparts clouded grayish-buff.

Measurements of type.—Head and body, 390 mm.; tail vertebræ, 150; hind foot, without claws, 93; ear, 33. Skull: Condylobasal length, 66.7; zygomatic breadth, 38.5; least postorbital breadth, 14.5; upper molar-premolar row, 18.5; length of mandible, 43.3; lower molar-premolar row, 21.4.

Specimens examined.—Three from the type locality.

Vol. XXVI, pp. 5–8 January 18, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW SPECIES OF RUMINANTS FROM THE PLEISTOCENE OF IOWA.

BY OLIVER P. HAY.

The materials here described are in the paleontological collection of the University of Iowa, and have been submitted to me for study by the Director of the Geological Survey of Iowa, Prof. George F. Kay.

Cervalces roosevelti sp. nov.

Type the greater part of a right antler, with a large part of the right half of the skull, which was discovered in a pit near Denison, Crawford County, Iowa. The age of these deposits was once supposed to be Aftonian, but this is not now regarded as certain. The age can not be late Pleistocene for there are above the deposits two beds of loess.

Dr. Calvin, in 1908,* referred to this antler as that of a large stag related to *Cervalces scotti*. A comparison of the figure here presented with the illustration published by Prof. W. B. Scott † will show that the beam of *C. roosevelti* has nearly twice the length of that of *C. scotti*.

Distance from midline of skull to burr of the antler	105 mm.
Distance from burr to base of ascending branch about	300 "
Distance from burr to outer extremity of the antler (some missing)	380 "
Height of ascending branch from lower border of beam, excluding missing portion	335 "
Diameter of beam at middle of length	55 "

The distance from the burr to the base of the ascending branch in *C. scotti* is only about 180 mm. There does not appear to have been in the Iowa specimen a horizontally directed palmation at the distal end of the beam such as existed in *C. scotti*.

* Bull. Geol. Soc. Amer., Vol. XX, p. 350.

† Proc. Acad. Nat. Sci. Phila., 1885, p. 190, fig. 5.

This species is named in honor of Colonel Theodore Roosevelt, in recognition of his services in behalf of the natural history of mammals, and especially in recognition of his contributions to a knowledge of *Alces*

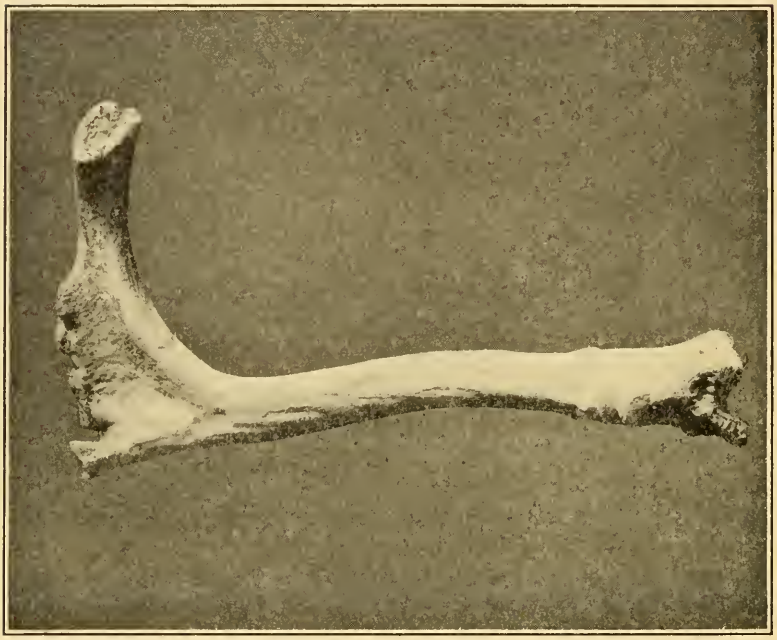

Fig. 1.—*Cervalces roosevelti*. Part of skull and part of right antler. x.186.

americanus, the American Moose, the living representative of the animal here described.

Aftonius gen. nov.

A genus belonging to the Bovidæ. Horn-cores laterally compressed, without definite keel in front; strongly curved backward, then straightening and turning somewhat inward. Frontal bone with large sinuses at the base of the pedicels of the horn-cores. *Type*, *Aftonius calvini*, new species.

Aftonius calvini sp. nov.

Type two horn-cores of same individual, found at Missouri Valley, Harrison County, Iowa, in Pleistocene deposits of the Aftonian stage.

The horn-cores here described were mentioned and one of them was figured* by Prof. Samuel Calvin in 1909; but this author did not attempt

* Bull. Geol. Soc. Amer., Vol. XX, pp. 350–351, pl. xxiii, fig. 1.

to identify them. In their present state there is no bone which connects the two masses representing the specimen; but they were probably connected as they lay in the gravel of the pit in which they were found. If the small piece of bone which is missing were present, many doubts would be dispelled.

Besides the horn-cores themselves a considerable part of each of the supporting frontal bones is present, including a considerable part of the brain-case. A small part of the distal end of the left core is missing, and still more of the right one.

Antero-posterior diameter at base of horn-core	75 mm.
Transverse diameter at base of horn-core	57 "
Greatest diameter of horn-core at 35 mm. from broken end . .	51 "
Diameter at right angles to this	40 "

In cross-section the cores are nearly flat on the mesial face, strongly convex on the outer face. Hinder border much broader than the anterior. Cores strongly bent, so that the axis of the terminal half is at nearly right angles with that of the proximal half and of the pedicel. Distal portion of the core nearly straight, as seen from without; turned somewhat mesially, as seen from above. Surface rough with grooves and pits for blood-vessels. Frontal bone occupied by large sinuses, which extend into the base of the horn-core, but not to the middle of its length.

The affinities of this animal are believed to have been with the goats.

This species is dedicated to the late Prof. Samuel Calvin, an enthusiastic investigator of the geology and the paleontology of the Pleistocene of Iowa.

Vol. XXVI, pp. 9–12 January 18, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ADDITIONAL NOTES ON THE DISTRIBUTION OF COLORADO MAMMALS.

BY EDWARD R. WARREN.

Two collecting trips which I made in Colorado in 1912 yielded some rather interesting data on the distribution of certain Colorado mammals. The first of these expeditions was in April and May, when I collected at Mack, Mesa County, about ten miles east of the Utah line, at an altitude of 4540 feet, in an arid, desert region; at Atchee, Garfield County, about thirty miles northerly from Mack, on the Uintah Railway, on the southern slope of the Book Plateau, at 6340 feet; at the Sieber Ranch on Little Dolores Creek, Mesa County, some twenty miles westerly from Grand Junction, and six miles east of the Utah line, at 5675 feet. This last point was selected because to some extent it helped fill up the gap between the work done by Merritt Cary on the Dolores River to the South, and that done on the Grand River to the north. It was in a valley, sometimes quite narrow and again opening out into quite wide level spaces, always with rather high red sandstone walls on either side.

My second expedition was to San Acacio, in southern Costilla County, in a part of the San Luis Valley where no collecting had previously been done. This was a level prairie region, the altitude of the town being 7740 feet. Culebra Creek is a little south of the town and the northwesterly extension of the San Luis Hills is about three miles west. The Culebra Range, with some high, rugged peaks, is twenty miles to the eastward. I made a week's trip to Culebra Cañon in this range. I also did a few days' work at Blanca, sixteen miles north of San Acacio. My Costilla County collecting was done the last of June and first three weeks of July.

The following are the mammals whose capture seems worthy of note:

Perognathus apache.

A single specimen of this Pocket Mouse was taken at the Sieber Ranch, Mesa County. No Pocket Mice of any species were taken at San Acacio, though I saw a few holes on the prairie which I thought were made by these animals.

Thomomys fossor.

One taken in Culebra Cañon at 8900 feet, and workings seen at various altitudes up to 10,700 feet, the highest altitude reached by me.

Thomomys talpoides agrestis.

Several Pocket Gophers were trapped near San Acacio. Unfortunately most of these were young, the rest being adult females, no grown males being taken. This rendered their identification somewhat difficult, but Vernon Bailey of the Biological Survey, to whom they were submitted, considers them *T. agrestis*, and they agree very well with topotypes of that species in my collection. This extends the range of this species some thirty-five miles southerly from the type locality, Medano Ranch, in northern Costilla County, and is the more interesting because at Antonito, about twenty-seven miles southwesterly, and on the west side of the Rio Grande River, *Thomomys aureus pervagus* has been taken. Much yet remains to be done to determine the ranges of the Pocket Gophers of the San Luis Valley.

My thanks are due to the Biological Survey and Mr. Bailey for examining the specimens.

Microtus mordax.

This Meadow Mouse was trapped at about 9100 feet in Culebra Cañon.

Neotoma mexicana fallax.

This Wood Rat was taken at the Sieber Ranch, Mesa County; and in the San Luis Hills, near San Acacio, Costilla County, this latter being the first record of the species for any portion of the San Luis Valley.

Neotoma desertorum.

The capture of the Desert Wood Rat at Mack, Mesa County, extends the range of this Lower Sonoran species into Colorado in an entirely new region, the only previous record for the State being Rangely, on the lower White River, where it was taken by Cary. I took several specimens in sandstone ledges about a mile southwest of the railroad station at Mack, where it seemed fairly common, judging from the nests seen. April 25th, 1912, young about a third grown were taken, and at about the same date pregnant females were captured. This would indicate that they begin to breed very early in the spring, and that at least two litters are raised in

a season. As I have taken *N. fallax* at Grand Junction, twenty miles easterly from Mack, the ranges of the two species no doubt overlap somewhere between these two points.

Neotoma cinerea orolestes.

This bushy tailed Wood Rat was taken at Atchee, Garfield County, where it seemed common. A Wood Rat of some sort was evidently abundant about the rocks at Carbonera, seven miles south of Atchee, 5400 feet, but as I did no collecting at that place can not say if it is the present species. Also taken in Culebra Cañon, Costilla County, at 9100 feet.

Peromyscus nasutus.

This large-eared Deer Mouse was common near San Acacio, about the same rocks where *Neotoma fallax* was taken. This is the first record of the species from the San Luis Valley.

Peromyscus truei.

True's Deer Mouse was found at Mack and Sieber Ranch, Mesa County, and Atchee, Garfield County.

Peromyscus crinitus auripectus.

The Buff-breasted Cañon Mouse was taken at Mack and at Atchee. The latter locality is probably nearly the northern limit of its range along the western border of Colorado, as the altitude increases rapidly above this place and soon gets above the zonal range of the species.

Eutamias quadrivittatus.

The Colorado Chipmunk was found in the San Luis Hills near San Acacio.

Eutamias amœnus operarius.

This Chipmunk was found in the San Luis Hills near San Acacio, also in the brush along Culebra Creek near that place. It was noted in the sage brush near the town of San Luis, and was the only species of Chipmunk I found in Culebra Cañon.

Neosorex navigator.

One taken in Culebra Cañon, at 9100 feet.

Vol. XXVI, pp. 13–14 January 18, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SALICORNIA.

BY IVAR TIDESTROM.

On August 6, 1912, Messrs. Kearney and Shantz collected some very interesting plants in the Toele Valley, some three miles northwest of Grantsville, Utah. The place where the plants grew is situated south of the Great Salt Lake and near the base of the Stansbury Range. The principal species collected bore the aspect of the desert flora—the Chenopodiaceae and Compositae being well represented. In the collection there is a species of *Salicornia* hitherto unknown, for which the following name and diagnosis are proposed:

Salicornia utahensis.

Perennis basi lignosa, 2dm. plus minusve alta; caulibus pluribus decumbentibus vel erectis, ramis erectiusculis; articulis caulium 15–18 mm. longis, 3–5 mm. crassis, ramorum tenuioribus; spicis 7–10 articulatis, 15–20 mm. longis, crassitudine plus minusve 4 mm.

Type in the U. S. National Herbarium, Kearney and Shantz, No. 3249, collected near the shore of the Great Salt Lake in strongly saline soil, moist to the surface.

Distinguished from *Salicornia ambigua* and *S. subterminalis* (the one of the Atlantic, the other of the Pacific Coast) by its short, thick spikes. In the former the spikes are from 18–20 jointed, while in the latter the number of joints is 13 or more, consequently much longer than in our species, while the thickness of the spikes in the old species is scarcely more than one-half of that of *S. utahensis*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A REVISION OF THE AMERICAN SPECIES OF *PERIPATUS*.

BY AUSTIN HOBART CLARK.

One of the most fascinating groups of existing organisms is that commonly referred to under the somewhat general term of "Peripatus." Not only do these animals offer most instructive data for morphological and phylogenetical speculation, but they also possess a most absorbing interest for those who inquire into the mysteries of zoögeography, especially from the palæogeographical side.

It is only within recent years that the knowledge of the various forms included in Guilding's old genus *Peripatus* has been brought to a point where it furnishes adequate data for the zoögeographer.

In the latest and most comprehensive work on the subject, the well known and most excellent monograph by Professor E. L. Bouvier (Annales des sciences naturelles, 9e série, tome 2, p. 1–383, pl. I–XIII, nov. 1905–jan. 1906; tome 5, p. 61–318, mars–juin 1907) the following classification for the fifty recognized species is proposed:

FAMILY PERIPATIDÆ.

Genera, *Peripatus* (divided into three sections, Andean forms, 12 species; Caribbean forms, 17 species; African forms, 1 species); *Eoperipatus* (3 species).

FAMILY PERIPATOPSIDÆ.

Genera, *Paraperipatus* (1 species); *Peripatopsis* (6 species); *Opisthopatus* (2 species); *Peripatoides* (4 species); *Ooperipatus* (4 species).

Evans in 1901 grouped the five genera of the Peripatopsidæ into three subfamilies, Peripatoidinæ (*Peripatoides*, *Ooperipatus* and *Opisthopatus*),

Paraperipatinæ (*Paraperipatus*) and Peripatopsinæ (*Peripatopsis*); but Professor Bouvier is inclined to admit only two subfamilies, one including *Peripatoides* and *Ooperipatus* as its first and *Opisthopatus* as its second section, the other including *Paraperipatus* as its first and *Peripatopsis* as its second section.

While by this arrangement one gets a very good idea of the interrelationships of the Old World forms, the disposition of the American species is not quite so satisfactory. The genus *Peripatus* as understood by Professor Bouvier, including as it does thirty diverse species ranging throughout tropical America, is unwieldy and does not lend itself readily to the solution of problems in zoögeography.

But Professor Bouvier has indicated a number of lines along which the genus *Peripatus* naturally falls into smaller units, and these smaller units are found to agree in their distribution as well as in their systematic unity with accepted genera belonging to other classes of animals.

It seems advisable, therefore, to recognize these smaller units as in reality of generic rank.

Mesoperipatus Evans.

Genotype.—Peripatus tholloni Bouvier, 1898.

Diagnosis.—The anal glands of the males open in front of the anus in a common groove; there are three pedal papillæ, two anterior and one posterior; the creeping pad has three bands; the nephridial tubercles of the fourth and fifth legs are situated beyond the third band of the creeping pad.

Distribution.—French Congo.

Included Species.—Mesoperipatus tholloni (Bouvier).

Oroperipatus Cockerell.

Genotype.—Peripatus lankesteri Bouvier, 1899.

Diagnosis.—The anal glands open in front of the anus by two distinct orifices; there are from four to seven pedal papillæ; the creeping pad has at least four bands; the nephridial tubercles of the fourth and fifth legs are included in the third band of the creeping pad.

Distribution.—Pacific watershed of tropical America, from Tepic, Mexico, southward to Sorata, Bolivia.

Included Species.—

O. balzani (Camerano)
O. belli (Bouvier)
O. cameranoi (Bouvier)
O. corradoi (Camerano)
O. eiseni (Wheeler)
O. equadoriensis (Bouvier)
O. goudoti (Bouvier)
O. intermedius (Bouvier)
O. lankesteri (Bouvier)
O. quitensis (Schmarda)
O. soratanus (Bouvier)
O. tuberculatus (Bouvier).

The genus *Peripatus* as restricted by the removal of the two genera described above may to advantage be divided into the following subgenera:

Plicatoperipatus subgen. nov.

Genotype.—Peripatus jamaicensis Grabham and Cockerell, 1892.

Diagnosis.—The dorsal transverse folds number twenty-four to each segment, and are always very indistinct as a result of the numerous and irregular anastomosings of the furrows which separate them; the primary papillæ of the back are small and subequal; accessory papillæ are rare or absent; crural tubercles occur on the two pregenital pairs of legs in the male.

Distribution.—Known only from the island of Jamaica.

Included Species.—Plicatoperipatus jamaicensis (Grabham and Cockerell).

Macroperipatus subgen. nov.

Genotype.—Peripatus torquatus von Kennel, 1883.

Diagnosis.—The dorsal transverse folds number twelve to each segment, and are separated by continuous furrows except between the legs where some of them ordinarily bifurcate; the primary papillæ of the back have quadrangular bases, being separated by grooves parallel to the longitudinal axis of the body; the accessory tubercles are ordinarily small and few in number; crural tubercles are present on the two pregenital pairs of legs (at least in *M. perrieri*).

Distribution.—Rio de Janeiro, Brazil, French and British Guiana, and Trinidad, westward to Panama, and northward to Vera Cruz, Mexico.

Included Species.—

M. geayi (Bouvier). *M. ohausi* (Bouvier)
M. guianensis (Evans) *M. perrieri* (Bouvier)
M. torquatus (von Kennel).

Peripatus *sensu stricto.*

Genotype.—Peripatus juliformis Guilding, 1825.

Distribution.—West Indian islands of Jamaica, Porto Rico, Vieques, St. Thomas, Antigua, Guadeloupe, Dominica and St. Vincent; Venezuela, from La Guayra and Caracas westward to Puerto Cabello and Tovar (near Mérida).

Included Species.—

P. antiguensis Bouvier *P. dominicæ* Pollard
P. bavayi Bouvier *P. juanensis* Bouvier
P. brölemanni Bouvier *P. juliformis* Guilding
P. danicus Bouvier *P. sedgwicki* Bouvier
P. swainsonæ Cockerell.

Epiperipatus subgen. nov.

Genotype.—Peripatus edwardsii Blanchard, 1847.

Diagnosis.—The dorsal folds number twelve to each segment, and are separated by continuous furrows except between the legs where some of them ordinarily bifurcate; the primary papillæ of the back have more or less rounded bases; the accessory papillæ are very diversely developed;

the primary papillæ of the dorsal surface are all of the same type; in medium sized and large specimens they intergrade through all stages, while in small specimens certain ones are markedly prominent, these papillæ are very near together, but it is not rare to find between them accessory papillæ; crural tubercles occur on the legs of the two pregenital pairs in the males.

Distribution.—Santarem, Brazil, French, Dutch and British Guiana, Trinidad and Grenada, westward to Central America, ranging northward to Nicaragua, and possibly to British Honduras.

Included Species.—

E. barbouri (Brues)
E. biolleyi (Bouvier)
E. brasiliensis (Bouvier)
E. edwardsii (Blanchard)
E. evansi (Bouvier)
E. imthurmi (Sclater)
E. isthmicola (Bouvier)
E. nicaraguensis (Bouvier)
E. simoni (Bouvier)
E. trinidadensis (Sedgwick).

The American species of *Opisthopatus* appears to be sufficiently different from the African to warrant generic recognition, and I therefore propose for its reception the genus

Metaperipatus gen. nov.

Genotype.—*Peripatus blainvillei* Blanchard, 1847.

Diagnosis.—Nineteen to twenty-one pairs of legs, those of the posterior pair much reduced though always indicated; median band of the creeping pad very large; three pedal papillæ, one anterior, one posterior, and one dorsal; coxal vesicles much reduced or absent; no crural glands; endogenous eggs, measuring less than 100 μ; embryos united in groups of very different ages, but in each group all are at the same developmental stage.

Distribution.—Chile.

Included Species.—*Metaperipatus blainvillei* (Blanchard).

Classification.

The following arrangement is proposed for the genera belonging to this class:

Family PERIPATIDÆ Evans, 1902.

Subfamily Peripatinæ Evans (emended).

Included Genera.—*Mesoperipatus* Evans, 1901; *Oroperipatus* Cockerell, 1908; *Peripatus* Guilding, 1825 (with the subgenera *Plicatoperipatus* nov.; *Macroperipatus* nov.; *Peripatus* s. s.; and *Epiperipatus*).

Subfamily Eoperipatinæ nov.

Included Genus.—*Eoperipatus* Evans, 1901.

Family PERIPATOPSIDÆ Bouvier, 1904.

Subfamily Peripatoidinæ Evans, 1901.

Section I.

Included Genera.—Peripatoides Pocock, 1894; *Ooperipatus* Dendy, 1900; *Symperipatus* Cockerell, 1913.*

Section II.

Included Genera.—Opisthopatus Purcell, 1899; *Metaperipatus* nov.

Subfamily Peripatopsinæ Evans, 1901.

Section I.

Included Genus.—Paraperipatus Willey, 1898.

Section II.

Included Genus.—Peripatopsis Pocock, 1894.

* A NOTE ON THE AUSTRALIAN PERIPATOPSIDÆ.

Several years ago I came to the conclusion (Science, vol. 27, No. 694, Apr. 17, 1908, p. 620) that *Ooperipatus oviparus* Dendy deserved a distinctive generic name, and that the *O. insignis* of Bouvier (Annales des sciences naturelles, 9e série, tome 5, 1907, p. 267) from Tasmania could not retain the name assigned to it, the original *insignis* having been a different animal.

At the request of Mr. A. H. Clark I now give the new names considered necessary in this connection: (1) **Symperipatus,** gen. nov., for *Symperipatus oviparus* (*Peripatus oviparus*) Dendy; (2) **Ooperipatus spenceri,** nom. nov., for the species described by Bouvier under the name of *Ooperipatus insignis.*—T. D. A. Cockerell.

Vol. XXVI, pp. 21–26 February 8, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

BIRD MIGRATION IN THE DISTRICT OF COLUMBIA.

BY WELLS W. COOKE,

Bureau of Biological Survey.

Five years ago an article was published in these Proceedings under the above title, giving a summary of the data at that time available on the movements of the birds in the District of Columbia. The last five years have been marked by great activity in bird study. During each of these years notes on migration have been contributed by more than twenty-five persons, connected for the most part with the Biological Survey or with the very flourishing local Audubon Society. The following table is based on these notes in addition to those already published, making a total of more than thirty-five years of observations. The first part of the table contains 98 species, which occur regularly in the District each year, arranged chronologically in the order of their arrival; to these is added a list of 9 species, visitors from the north, which are more or less common in the District during the winter, arranged in the order of their departure. This is followed by a list of 41 species that occur in the District throughout the whole year. The three lists comprise a total of 148 species which constitute the regular bird population of the District, and most of which are common enough to be expected in the yearly list of any good observer.

The District of Columbia in an ornithological sense includes the country within a radius of ten miles of the Capitol, but this limit has been exceeded to include notes taken at the Great Falls of the Potomac. No addition has been made to the bird list of this area during the past five years and the total still

stands at 293 species. Among the notable occurrences of rare visitors may be mentioned the Prothonotary Warbler at Dyke, Va., April 30–May 2, 1911; Pine Siskin, near Bennings, April 6, 1912; Bachman Sparrow, one all the summer of 1912 near Lanham, Md.; Olive-sided Flycatcher, May 9, 1912; King Rail, eggs May 30, 1910, near Long Bridge; Black Rail, near Bennings Bridge, September 1, 1908; American Bittern, at Dyke, April 8, 1911, and April 21, 1912; American Egret, at Anacostia, first three weeks of August, 1912; Little Blue Heron, several July 29 and September 24, 1911, near Anacostia. In addition to the records of the Philadelphia Vireo already given, it has been noted May 17, 1888; May 29, 1897; September 22, 1889; September 16, 1894; September 15, 1895; September 8, 10, 15, and 20, 1896, and September 14, 1899.

Spring Migration in the District of Columbia.

Species.	Average date of spring arrival.	Earliest date of spring arrival.	Average date of the last one seen.	Latest date of the last one seen.
Purple Grackle	Feb. 20	Rare, winter	Breeds	
Woodcock	March 2	Feb. 14, 1884	Breeds	
Red-winged Blackbird	" 2	Rare, winter	Breeds	
Killdeer	" 6	Feb. 14, 1908	Breeds	
Hermit Thrush	" 9	Rare, winter	May 3	May 17, 1902
Phoebe	" 10	Jan. 10, 1909	Breeds	
Fox Sparrow	" 12	Rare, winter	April 6	May 11, 1882
Wilson Snipe	" 15	Mar. 9, 1894	May 2	May 11, 1907
Flicker	" 16	Rare, winter	Breeds	
White-throated Sparrow	" 18	Rare, winter	May 19	June 11, 1899
Cowbird	" 20	Rare, winter	Breeds	
Savannah Sparrow	" 21	Rare, winter	May 4	May 11, 1885
Pipit	" 21	Feb. 16, 1908		May 14, 1910
Mourning Dove	" 21	Rare, winter	Breeds	
Vesper Sparrow	" 21	Rare, winter	April 5	Rare, sum'r
Kingfisher	" 25	Rare, winter	Breeds	
Chipping Sparrow	" 26	Mar. 9, 1902	Breeds	
Chewink	" 26	Rare, winter	Breeds	
Myrtle Warbler	" 30	Rare, winter	May 12	May 23, 1903
Purple Martin	" 31	Mar. 9, 1908	Breeds	

Species.	Average date of spring arrival.	Earliest date of spring arrival.	Average date of the last one seen.	Latest date of the last one seen.
Pine Warbler	March 31	Mar. 6, 1910	Breeds	
Great Blue Heron	April 3	Jan. 5, 1913		June 23, 1907
Brown Thrasher	" 3	Mar. 22, 1908	Breeds	
Louisiana Water Thrush	" 5	April 1, 1910	Breeds	
Blue-gray Gnatcatcher	" 7	Mar. 30, 1907	Breeds	
Tree Swallow	" 7	Mar. 26, 1887	May 12	May 26, 1889
Ruby-crowned Kinglet	" 8	Rare, winter	May 6	May 15, 1885
Yellow Palm Warbler	" 9	Mar. 31, 1889	April 26	May 1, 1892
Rough-winged Swallow	" 9	Mar. 31, 1912	Breeds	
Yellow-throated Warbler	" 11	April 5, 1910	Breeds	
Swamp Sparrow	" 12	Rare, winter	May 12	May 19, 1859
Osprey	" 12	Mar. 19, 1905	Breeds	
Barn Swallow	" 13	Mar. 30, 1890	Breeds	
Black and White Warbler	" 14	April 8, 1888	Breeds	
Upland Plover	" 15	Mar. 21, 1896		April 24, 1890
Chimney Swift	" 17	April 6, 1905	Breeds	
Solitary Vireo	" 18	April 6, 1905	May 9	May 18, 1896
Henslow Sparrow	" 18	April 10, 1889	Breeds	
House Wren	" 18	Mar. 26, 1910	Breeds	
Green Heron	" 19	April 9, 1905	Breeds	
Whippoorwill	" 19	April 8, 1909	Breeds	
Spotted Sandpiper	" 19	April 2, 1905	Breeds	
Bank Swallow	" 20	April 13, 1904	Breeds	
Ovenbird	" 20	April 10, 1904	Breeds	
Yellow Warbler	" 21	April 4, 1862	Breeds	
Grasshopper Sparrow	" 21	April 16, 1912	Breeds	
Maryland Yellowthroat	" 21	April 13, 1891	Breeds	
Prairie Warbler	" 21	April 12, 1883	Breeds	
White-eyed Vireo	" 22	April 10, 1912	Breeds	
Redstart	" 22	April 15, 1877	Breeds	
Catbird	" 22	Mar. 19, 1905	Breeds	
Parula Warbler	" 23	April 17, 1912	Breeds	
Wood Thrush	" 23	April 18, 1909	Breeds	
Yellow-throated Vireo	" 24	April 17, 1912	Breeds	
Red-eyed Vireo	" 26	April 21, 1895	Breeds	
Solitary Sandpiper	" 28	April 24, 1909	May 16	May 21, 1906

Species.	Average date of spring arrival.	Earliest date of spring arrival.	Average date of the last one seen.	Latest date of the last one seen.
Black-throated Green Warbler	April 29	April 22, 1905	May 16	May 30, 1907
Kingbird	" 29	April 18, 1896	Breeds	
Northern Water-Thrush	" 29	April 22, 1894	May 25	June 2, 1907
Great-crested Flycatcher	" 29	April 20, 1896	Breeds	
Chat	" 30	April 16, 1876	Breeds	
Hooded Warbler	" 30	April 19, 1896	Breeds	
Scarlet Tanager	" 30	April 17, 1896	Breeds	
Indigo Bunting	" 30	April 25, 1908	Breeds	
Warbling Vireo	May 1	April 21, 1895	Breeds	
Wilson Thrush	" 1	April 26, 1896	May 18	June 2, 1907
Marsh Wren	" 1	April 15, 1896	Breeds	
Cliff Swallow	" 1	April 10, 1887	May 13	June 7, 1877
Hummingbird	" 1	April 16, 1912	Breeds	
Black-throated Blue Warbler	" 1	April 19, 1896	May 20	May 30, 1888
Summer Tanager	" 1	April 18, 1896	Breeds	
Least Flycatcher	" 2	April 20, 1881	May 15	May 20, 1904
Worm-eating Warbler	" 2	April 25, 1908	Breeds	
Orchard Oriole	" 2	April 25, 1908	Breeds	
Baltimore Oriole	" 2	April 24, 1912	Breeds	
Bobolink	" 2	April 26, 1896	May 20	May 30, 1877
Chestnut-sided Warbler	" 2	April 19, 1902	May 24	May 30, 1891
Nighthawk	" 3	April 19, 1891	May 24	Rare, sum'r
Golden-winged Warbler	" 3	April 30, 1910	May 15	Rare, sum'r
Kentucky Warbler	" 3	April 29, 1906	Breeds	
Blackburnian Warbler	" 3	April 30, 1905	May 21	June 3, 1907
Nashville Warbler	" 4	April 29, 1885	May 15	May 19, 1887
Rose-breasted Grosbeak	" 4	May 1, 1907	May 16	May 30, 1907
Olive-backed Thrush	" 4	April 19, 1896	May 22	June 2, 1907
Blue-winged Warbler	" 4	April 26, 1891	May 22	Rare, sum'r
Wood Pewee	" 5	April 29, 1900	Breeds	
Blue Grosbeak	" 5	May 1, 1878	Breeds	
Black-poll Warbler	" 5	April 28, 1860	June 1	June 16, 1907
Magnolia Warbler	" 6	April 22, 1891	May 25	May 31, 1909
Acadian Flycatcher	" 6	April 29, 1845	Breeds	
Cape May Warbler	" 6	May 1, 1893	May 16	May 20, 1882
Canadian Warbler	" 6	May 3, 1908	May 24	June 2, 1907

Species.	Average date of spring arrival.	Earliest date of spring arrival.	Average date of the last one seen.	Latest date of the last one seen.
Yellow-billed Cuckoo	May 7	May 3, 1907	Breeds	
Black-billed Cuckoo	" 7	May 2, 1908	Breeds	
Wilson Warbler	" 8	May 1, 1876	May 23	May 30, 1910
Gray-cheeked Thrush	" 10	May 7, 1912	May 27	May 31, 1897
Bay-breasted Warbler	" 11	May 2, 1896	May 20	May 27, 1888
Yellow-bellied Flycatcher	" 11	May 9, 1902	May 26	May 30, 1891
Alder Flycatcher	" 15	May 8, 1906	May 21	May 28, 1893
Mourning Warbler	" 17	May 6, 1896	May 26	May 30, 1907
WINTER RESIDENTS.				
Tree Sparrow			Mar. 26	April 2, 1909
Rusty Grackle			April 12	April 30, 1875
Golden-crowned Kinglet			April 13	April 27, 1888
Yellow-bellied Sapsucker			April 14	May 13, 1905
Winter Wren			April 26	May 1, 1882
Brown Creeper			April 27	May 1, 1907
Junco			April 30	May 17, 1908
Red-breasted Nuthatch			May 1	May 12, 1889
Purple Finch			May 9	May 26, 1907

PERMANENT RESIDENTS.

The following species occur in the District throughout the entire year:

Bluebird*
Robin*
Carolina Chickadee
Tufted Titmouse
White-breasted Nuthatch
Carolina Wren
Mockingbird (rare)
Migrant Shrike†
Cedarbird
Cardinal
Song Sparrow
Field Sparrow*
Goldfinch
Red Crossbill†
Meadowlark*
Fish Crow
Common Crow
Blue Jay
Red-bellied Woodpecker (rare)
Red-headed Woodpecker*
Pileated Woodpecker (rare)
Downy Woodpecker
Hairy Woodpecker (rare)
Great Horned Owl
Screech Owl
Barred Owl
Long-eared Owl
Barn Owl
Sparrow Hawk
Bald Eagle
Broad-winged Hawk
Red-shouldered Hawk
Red-tailed Hawk
Cooper Hawk
Sharp-shinned Hawk
Marsh Hawk†
Turkey Vulture
Ruffed Grouse (rare)
Bob-white
Night Heron*
Wood Duck*

* Rare in winter. † Rare in summer.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW *UTA* FROM NEVADA.

BY ALEXANDER G. RUTHVEN,
University of Michigan Museum of Natural History.

The Walker-Newcomb Expedition of the University of Michigan, in the summer of 1912, obtained a large series of Utas in northeastern Nevada that appear to represent a well-defined subspecies of *Uta stansburiana*. None of the several names in the synonomy of the typical form can be applied to this race.

Uta stansburiana nevadensis subsp. nov.

Diagnosis.—Similar to *Uta stansburiana* in size, proportions and scalation, except that the dorsal scales are less strongly keeled and smaller, the distance from the end of the snout to the notch in the posterior side of the occipital plate being equal to 25–30 scales on the middle of the back as compared with 18–23 in the *Uta stansburiana*. Dorsal scales increasing in size posteriorly from the head but still pearl-like above for some distance behind the shoulders; on the back feebly keeled, the keels often being almost tubercular. Femoral pores 12–15 in 28 specimens, average 13.6. Tail 1.45–1.84 times length of head and body in 22 specimens, average 1.66. Ground color above dark to pale olive (generally about 163* or 167 to 172 or a little lighter) relieved by many small spots (about the size of four scales) of pale greenish blue (367), and generally by many small black spots (about the size of two scales) that are seldom well defined and exhibit a tendency to be arranged in four rows, two on each side of the back. On the sides numerous rounded or vertically elongated spots that are dull yellowish (203d) in the females, and orange (91) above and dark red (82) below in the males, the latter color also suffusing the sides of the belly. A single row of dark cross bars on the tail. A dark stripe through the eye and one below the eye, both continued on the temples; occasionally a faint indication of a light stripe between the two and of another below the lower one, but these never distinct on the neck or indicated on the body. Belly dull white in the females and young males, becoming bluish in old males. Throat in females white or dusky, barred with bluish slate and white or pale orange, in the males dark blue (sometimes 394) in gular region with numerous lateral bars of bluish

* Code des Couleurs, Klincksieck et Valette, Paris.

slate and red (82) or orange (91). Sides of neck and proximal half of anterior face of arms in both males and females with numerous spots of white, orange or red, according to development of these colors on the chin and throat. Black axillary spot distinct but not sharply defined or definitely margined with a lighter color.

Habitat.—Cortez and River Ranges near Carlin, Nevada.

Type-specimen.—Cat. No. 43,848, University of Michigan Museum of Natural History; Cortez Range west of Carlin, Nevada, July 13, 1912. F. Gaige, collector.

Fig. 1.—Photograph of *Uta stansburiana nevadensis* (a and b) and *Uta stansburiana* (c) to show difference in color pattern.

Description of Type-specimen.—Adult male. Head and body 51 mm., tail 84 mm. Body and head depressed. Upper head plates large and smooth and somewhat convex; interparietal largest; four enlarged supraoculars, separated from frontal by one row of granules; frontal divided transversely; a pair of prefrontals preceded by three large hexagonal plates and these in turn by six small plates in pairs. Four supralabials and five infralabials to below the eye. Gular scales smooth, scales on edge of fold enlarged. Lateral neck scales granular, grading into somewhat larger ones on the dorsal surface. Dorsals increasing in size from the head posteriorly, but still small and not distinctly keeled above the shoulders. Dorsal body scales small and feebly keeled, about 27 equaling the distance from the end of the snout to posterior margin of the interparietal, becoming smaller laterally and larger near the tail.

Ground color dark olive (163) relieved by small spots of pale blue (367). Small dark spots only faintly indicated. Sides above the fold spotted with pale orange (91), and below the fold with red (82), the latter color suffusing the sides of the belly. Axillary spots glossy black, not margined with lighter. Tail with faint cross bars. Head brownish olive (155). Belly grayish slate; gular region dark blue; edge of gular fold and spots or short bars on the sides of the chin and neck and on the anterior face of the arm pale orange (91).

Notes on Paratypes.—There are 53 paratypes and in this series there is little variation, particularly in the distinctive characters. As already stated, the dorsal scales vary slightly in size, 25–30 in the length of the head from the posterior margin of the interparietal. The tail is 1.45–1.84 times the total length, average in 22 specimens 1.66. The femoral pores vary from 12–15, average in 28 specimens 13.6. The coloration is very constant. The ground color above runs from light to dark brownish olive, which causes the small spots of blue and black to vary in conspicuousness, but they are always approximately of relatively the same size and shape even in the newly born, and the blue spots are nearly always conspicuous.

Remarks.—There can be no doubt of the distinctness of this form from *Uta stansburiana*. The most conspicuous difference is in the color pattern which is remarkably constant in our material (Fig. 1). Occasional specimens of the typical form have a similar color pattern, but in none of the collections that the writer has examined are the dark U-shaped blotches and the lateral stripes persistently absent or the blue spots so large and generally distributed as in the variety. The dorsal scales are constantly one-fourth or one-fifth smaller than in *Uta stansburiana*, and it should also be pointed out that the femoral pores are apparently fewer than the number given for the typical form by Cope,* Van Denburgh† and Ruthven.‡

Habits.—We found this Uta only in the spurs of the Cortez Range and in the River Range at Moleen Canyon. In the former locality it was not common, but in Moleen Canyon it occurred in some numbers. It was closely confined to the vicinity of rocks. Occasional specimens were found on the ground, but the majority were on the large rocks along the cliffs, upon which it climbs with all the facility of *Sceloporus biseriatus*, which frequents the same habitat. The stomach contents of two specimens are made up of insects and spiders. Females taken on July 6 contained large eggs, others taken on July 8 contained no eggs, which would indicate that they were laid about this time. On August 14 the young were seen for the first time. On this date four individuals between 22–24 mm. in body length were found on the ground between the large rocks in Moleen Canyon. They were very agile and when alarmed quickly sought shelter under loose stones.

* Cope, E. D., Crocodilians, Lizards and Snakes of North America. Rept. U. S. Nat. Mus., 1898 (1900), p. 308.

† Van Denburgh, J. The Reptiles of the Pacific Coast and Great Basin. Occ. Papers Calif. Acad. Sci., V (1897), p. 67.

‡ Ruthven, A. G. A Collection of Reptiles and Amphibians from Southern New Mexico and Arizona. Bull. Amer. Mus. Nat. Hist., XXIII, pp. 529–530.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FIVE NEW MAMMALS FROM TROPICAL AMERICA.

BY GERRIT S. MILLER, Jr.

[By permission of the Secretary of the Smithsonian Institution.]

The United States National Museum contains specimens of the following hitherto undescribed mammals from various parts of tropical America.

Marmosa purui sp. nov.

Type.—Adult male (in alcohol), No. 105,543, U. S. National Museum. Collected at Hyutanaham, upper Purus River, Brazil, March, 1901, by J. B. Steere.

Diagnosis.—Like *Marmosa keaysi* (Allen) but smaller; skull with braincase less elevated, interparietal less obtuse anteriorly, and posterior border of nasals not distinctly emarginate; teeth not noticeably different from those of *M. keaysi*, but premolars less compressed, and space between first and second tooth scarcely greater than that between pm^1 and canine; color as in *M. keaysi* except that the dorsum of manus and pes is concolor with buffy of underparts.

Measurements.—Type: head and body, 120; tail, 150; hind foot, 19.5; ear from meatus, 19; condylobasal length of skull, 34.6; greatest length, 35.0; zygomatic breadth, 17.6 interorbital breadth, 6.2; breadth of braincase, 11.8; median depth of braincase, 8.6 ±; nasal, 15.0; mandible, 25.0; maxillary toothrow, exclusive of incisors, 13.8; mandibular toothrow, exclusive of incisors, 14.0.

Specimens examined.—Two, both from the type locality.

Remarks.—Dr. J. A. Allen has kindly sent me two skins of the Peruvian *Marmosa keaysi* for comparison with the Purus River animal. Although nearly related, the two forms appear to be readily distinguishable. The second specimen of *Marmosa purui* is a breeding female with unworn teeth. It is considerably smaller than the type (in which the teeth are slightly worn): head and body, 110: tail, 125; hind foot, 17; ear from meatus, 18; condylobasal length of skull, 30.6; mandible, 22.2; maxillary toothrow, 12.4.

Glossophaga rostrata sp. nov.

Type.—Adult male (skin and skull), No. 111,500, U. S. National Museum. Collected on the Westerhall Estate, Grenada, Lesser Antilles, August 25, 1900, by Peter Gellineau. Original number, 29.

Diagnosis. — Externally like *Glossophaga longirostris* Miller, but general color averaging slightly less dark. Skull without appreciable peculiarities as compared with that of the mainland animal. Teeth differing from those of *G. longirostris* in the deeper emargination of m^1 and m^2, as a result of which the postero-external prolongation of crown (metastyle and base of metacone) is more sharply defined, while the main portion, bounded on outer side by paracone and point of metacone, and on inner side by protocone and its commissure, assumes a general outline that is almost square; last two lower cheek-teeth shorter than in *G. longirostris*, a peculiarity especially noticeable in m_3.

Measurements.—Type: tibia, 15; foot, 10.6; forearm, 37.4; thumb, 9.6; third finger, 82; fifth finger, 53; condylobasal length of skull, 21.8; zygomatic breadth, 10.0; rostral breadth across bases of canines, 4.0; breadth across interorbitral swellings, 5.2; mastoid breadth, 9.6; breadth of braincase, 9.0; depth of braincase, 7.0; mandible, 14.8; maxillary toothrow exclusive of incisors, 8.0; mandibular toothrow exclusive of incisors, 8.4.

Specimens examined.—Fourteen, all from the type locality. "Taken in hollow tree."

Remarks.—The Grenadan form of *Glossophaga*, though not conspicuously differentiated from the mainland representative of the *longirostris* group, has very constant characters in the outlines of the molar crowns. The skull shows no tendency toward the narrowing characteristic of the Curaçaon *G. elongata* or the reduction in size peculiar to the Jamaican *G. antillarum*. Two skulls of immature individuals taken by Mr. Gellineau at Roseau, Dominica, are not in condition for positive identification. They agree in dental peculiarities with the Grenadan form.

Brachyphylla minor sp. nov.

Type.—Adult female (in alcohol), No. 101,528, U. S. National Museum. Collected in Coles Cave, St. Thomas Parish, Barbados, Lesser Antilles, June 14, 1899, by P. McDonough.

Diagnosis.—Like *Brachyphylla cavernarum* Gray,* but size at and below the minimum; area of cheek-teeth reduced.

Measurements.—Type: head and body, 78; tibia, 25; foot, 17; forearm, 61.5; thumb, 15; third finger, 105; fifth finger, 80; ear from meatus, 20; width of ear, 13.5; condylobasal length of skull, 26.6; zygomatic breadth, 16.0; breadth of braincase, 12.0; mandible, 19.8; maxillary toothrow exclusive of incisors, 10.4; mandibular toothrow exclusive of incisors, 11.0.

* The United States National Museum contains about 200 specimens of true *cavernarum*, representing the islands of St. Vincent (type locality), St. Lucia, Dominica, Montserrat, Antigua, Barbuda, and Porto Rico. Practically all are preserved in alcohol. I have not been able to discover any characters to distinguish local forms.

Specimens examined.—Two, both from the type locality.

Remarks.—The skull of the type is smaller than any of the 40 skulls of *Brachyphylla cavernarum* with which I have compared it. That of the male is less reduced, its condylobasal length, 27.8 mm., exactly equalling that of the smallest female in the series of *cavernarum* (No. 106,058 from St. Vincent). The Barbadan animal is therefore less differentiated than the Cuban *B. nana*.

Ardops annectens sp. nov.

Type.—Adult female (in alcohol), No. 113,502, U. S. National Museum. Collected on the Island of Guadeloupe, Lesser Antilles, February 1, 1902, by H. Selwyn Branch.

Diagnosis.—Like *Ardops montserratensis* (Thomas) and *A. luciæ* Miller, but intermediate in size, the length of forearm and of skull in each sex obviously greater than in that of the latter and less than in that of the former.

Measurements.—Type and adult male (No. 113,498), the latter in parenthesis: head and body, 68 (61); tibia, 20 (18.6); foot, 14.6 (12.6); forearm, 48.6 (48); thumb, 15.4 (15); third finger, 114 (106); fifth finger, 78 (74); ear from meatus, 18 (17); condylobasal length of skull, 20.8 (19.2); greatest length of skull, 23.6 (22.2); zygomatic breadth, 15.4 (14.8); mastoid breadth, 13.2 (12.0); breadth of palate including m^1, 10.2 (9.8); mandible, 14.6 (13.0); maxillary toothrow, 7.8 (7.0); mandibular toothrow, 8.0 (7.2).

Specimens examined.—Five, all from the type locality.

Remarks.—Though not conspicuously different from its allies *Ardops annectens* appears to be constantly distinguishable from *A. montserratensis* and *A. luciæ* when individuals of the same sex are compared.

Promops pamana sp. nov.

Type.—Adult male (skin only), No. 105,528, U. S. National Museum. Collected at Hyutanaham, upper Purus River, Brazil, March 22, 1901, by J. B. Steere.

Diagnosis.—Like *Promops fosteri* (Thomas) but smaller (forearm 43 mm., metacarpal of third finger 44.5 mm., as compared with 46.4–48.4 and 50–53 respectively in seven males of *fosteri*).

Measurements.—Head and body, 70 = (70)*; tail, 32 = (46); tibia, 16.5 (17); foot, 9 (9); forearm, 43 (46.4); third finger, metacarpal, 44.5 (50); first phalanx, 20.2 (21.2); second phalanx, 19.2 (18); fourth finger, metacarpal, 43 (48); first phalanx, 17.5 (17); second phalanx, 4.2 (3.2); fifth finger, metacarpal, 28 (31); first phalanx, 12 (12); second phalanx, 4 (5).

Specimen examined.—The type.

* Measurements in parenthesis are those of the smallest among seven males of *M. fosteri*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

OGIC

DICHROMATISM IN *NEOTOMA MEXICANA FALLAX* FROM COSTILLA COUNTY, COLORADO.

BY EDWARD R. WARREN.

While collecting at San Acacio, Costilla County, Colorado, in June, 1912, I found a well marked case of dichromatism in *Neotoma mexicana fallax* Merriam. Briefly stated this took the form of dark-colored underparts, with the tail dark below as well as above, and the feet dark-colored down to the toes. As it is of a somewhat melanistic character I will, for convenience, refer to the specimens hereafter as melanistic.

The animals were captured in a low range of hills about three miles west of the town (the northwesterly end of the San Luis Hills), this being the first time the species had been taken in the San Luis Valley, Colorado. As usual, they were found among rocks, in this case an eruptive rock, dark brown in color, with a slight tendency toward a reddish tinge. Pieces of loose rock laying about were often a rusty red, but I saw no such rock in place. The soil about the rocks was not especially dark. I took careful note of these matters, thinking they might have some bearing on the coloration of the rats. My traps were set on one of the low ridges which form the range of hills, along the outcropping ledges on the summit, strung out for a distance of several hundred yards, and beginning near where the hill began to ascend from the prairie. I noticed that none of the melanistic rats were taken beyond a certain point, perhaps two hundred yards from where my trap line began. This may have been merely a coincidence, or it may mean that there was a family of the melanistic animals inhabiting that

area, though normally colored animals were captured there also. More extensive collecting will be necessary to determine this point.

In all twenty rats were trapped, 16 adults and 4 juveniles, the latter being evenly divided between the two colorations, while of the adults 11 were normal and 5 were melanistic. I regret that no account was kept of the number of normal individuals from the area in which the others were taken, but I did not realize until too late that these latter seemed to be confined to certain limits.

A more detailed description of the animals is as follows: The underparts of the melanistic examples are nearest the ochraceous buff of Ridgway but somewhat darker than the plate and with a vinaceous tinge; the base of the hair is plumbeous. This color in a somewhat modified shade forms the ground color of the upperparts, but is there given a dusky character by the admixture of black-tipped hairs. The face and top of the head are decidedly dusky, more so, especially the face, than in normal examples.

The upper part of the tail is black or slate black, shading imperceptibly into slate on the under side. The feet above are dark colored to the base of the toes (in one specimen the toes are dark). This color is now nearest Ridgway's mouse gray but darker, and my recollection is that in the fresh specimens it was nearer black.

The melanistic juveniles show the same characteristics, modified by the slaty-blue color of the juvenile coat. These were about half-grown.

In normal specimens from the same locality the underparts are white, the base of the hair being plumbeous as in the others. The sides are an ochraceous buff closely matching that of the other form, and the back is quite like the melanistic animals, but perhaps a trifle lighter and grayer, and the top of head and face are lighter. As the plates show, the feet are entirely white. The upper surface of tail is black, under white. There is sometimes an ochraceous-buff band on the chest between the forelegs; this is very variable, sometimes lacking entirely, sometimes extending clear across the chest, and various stages between these two extremes occur.

In comparing these specimens from San Acacio with others

Neotoma mexicana fallax. Dorsal surface. Fig. 1, melanistic; Fig. 2, normal coloration.

Neotoma mexicana fallax. Ventral surface. Fig. 1, melanistic; Fig. 2, normal coloration.

in my collection from various Colorado localities my attention was attracted by certain differences in color. Colorado Springs is the point nearest the type locality (Gold Hill, Boulder County, Colorado) from which I have specimens. My specimens agree very well with Goldman's description in his revision of the genus,* which was made from the type and topotypes, having a creamy buff on sides and back. Specimens from Howard, Fremont County, and Salida, Chaffee County, are very similar. Not one of some ten skins has any indication of a buff pectoral band.

The San Acacio skins differ from these in having ochraceous buff instead of cream buff, and I found this to be the case with skins from Grand Junction, and Sieber Ranch (on Little Dolores Creek), Mesa County; Bedrock and Coventry, Montrose County; Cortez and Ashbaugh's Ranch, Montezuma County. One skin from Coventry has a light buffy wash on the belly. All of these southwestern Colorado rats are a more distinct buff above than the Colorado Springs and Salida animals. While some of these skins are spring and summer specimens, others were taken at fall and winter dates which make them absolutely comparable with those from the more northeastern localities, which happen to have been taken at that season. A few of the southwestern animals show a pectoral band.

Goldman, *op. cit.*, mentions cases of dichromatism in various species of *Neotoma*, including *N. fallax* from Copperton, Mount Taylor, and Grant, New Mexico, though judging from his description none, with possibly one exception from Grant, seem to be of as strongly marked a character as that which I have just described. Other species in which he found dichromatism are *Neotoma albigula* from New Mexico, *N. torquata* from south-central Mexico, *N. desertorum* from Utah localities, and possibly *N. lepida stephensi* from near Grant, New Mexico.

The plates herewith illustrate the difference between the two phases, Plate I showing the dorsal surface, and Plate II the ventral. Figure 1 in each case is the melanistic example, and Figure 2 the normal.

* N. A. Fauna No. 31. Revision of the Wood Rats of the Genus Neotoma. By E. A. Goldman. 1910.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A LIST OF PLANTS COLLECTED ON ST. VINCENT ISLAND, FLORIDA.

BY W. L. McATEE,

U. S. Biological Survey.

St. Vincent Island, Florida, lies about 8 miles southwest of Apalachicola. It is the westernmost of a series of islands which bound St. George's Sound, and its western extremity, at Indian Pass, is scarcely a quarter of a mile from the mainland. The island contains about 1200 acres, and on all parts of it (except marsh) visited by the writer, the soil is practically pure sand. That part of the island nearest the mouth of the Apalachicola River, which is said to have the richest soil, and where a greater variety of mainland plants would be expected, was not explored.

A number of large ponds on the island drain through a channel which was dammed many years ago. The dam was allowed to disintegrate, but was renewed and has now been in place again for several years. The ponds therefore have at least twice changed from brackish to fresh water.

The plants reported upon were collected during investigations of the food habits of wild ducks, under authority of the Biological Survey. The writer was most hospitably entertained by Dr. R. V. Pierce, owner of the island. Doctor Pierce maintains the island as a game preserve, and is especially interested in improving the supply of food for ducks. A number of plants have therefore been introduced.

St. Vincent Island was a favorite collecting ground of Dr. A. W. Chapman, and no one regrets more than the writer that the worthy doctor did not see fit to label his specimens

more precisely. It is probable that a good proportion of his west Florida specimens came from St. Vincent, and if we could tell which, the flora of the island would undoubtedly now be well known. It is related that the doctor once was called to the island to set a broken leg. As some time was consumed in making the trip for the doctor and bringing him back, the patient was in considerable pain upon his arrival. After the leg was set and bandaged the patient requested the doctor to remain with him and make every effort to relieve the pain. However, Doctor Chapman, after remarking that pain was only natural in such cases and he had done all he could, lost no time in striking out through the woods to collect plants.

The writer was on St. Vincent Island from January 7 to January 14, and from October 30 to November 6, 1910, neither period a very favorable one for plant collecting. However, much was learned as to the time when mature fruits are present, and this data is presented in detail. Definite information on the ripening season is usually very scarce in plant lists. The only English names of plants given are a few unusual ones current on the island. The list includes 239 species of specifically identified indigenous plants, 10 whose identity is more or less in doubt, and 12 introduced species. One unidentified plant not listed is *Chara* sp. It figures as a wild duck food and is known as "musk grass." Tuber-bearing specimens have been collected in October.

The writer acknowledges, with gratitude, his indebtedness for determinations of specimens or other assistance, to a number of botanists including Mrs. Agnes Chase, Mr. H. H. Bartlett, Dr. E. L. Greene, Professor A. S. Hitchcock, Dr. John K. Small, Mr. Paul R. Standley, and Mr. Ivar Tidestrom.

OSMUNDACEAE.

Osmunda spectabilis Willd.

Osmunda cinnamomea L. The tufts of tomentum at bases of leaflets entirely disappear from old plants.

POLYPODIACEAE.

Pteridium aquilinum (L.) Kuhn.

Dryopteris thelypteris (L.) A. Gray.

PINACEAE.

Pinus caribaea Morelet. The dominant tree of the island. Never having been boxed for turpentine, forests of it still present a fine appearance.

JUNIPERACEAE.

Juniperus barbadensis L.

TYPHACEAE.

Typha latifolia L.

NAIADACEAE.

Zannichellia palustris L. In fruit March 20, 1911. Sometimes has small, somewhat lobed tubers at the base of the stems.

Ruppia maritima L. Puldoo grass. As a result of damming the outlet of a series of large ponds on St. Vincent, some years ago, a considerable proportion of these waters is now fresh. Corresponding to this change, *Ruppia* as a dominant growth has become restricted to ponds which, due to occasional tidal overflow, or seepage, are somewhat brackish. However, luxuriant growths of it have been noted in purely fresh water. Seeds were found in the stomachs of ducks collected from January 7 to January 14, 1910, and much new seed had already ripened, March 18, 1911.

Potamogeton lucens L. Not plentiful, local. Fruit not quite mature, August, 1910; an abundance ripe, October 3. Probably introduced with the following:

Potamogeton perfoliatus L. Widely but sparingly distributed. Introduced from Currituck Sound, N. C.

Potamogeton pusillus L. Abundant. Probably introduced.

Potamogeton pectinatus L. Widely distributed and abundant. Introduced from Currituck Sound, N. C., and Cayuga Lake, N. Y. Seeds ripe, October 3, 1910; tubers plentiful, December 23.

ZOSTERACEAE.

Zostera marina L. Transplanted from lagoons on mainland off Indian Pass to an almost enclosed shallow bay on St. Vincent.

NAIADACEAE.

Naias flexilis (Willd.) Rostk. and Schmidt. Probably introduced.

ALISMACEAE.

Sagittaria platyphylla (Engelm.) J. G. Smith. Propagated from a stock of tubers, the original ones of which were secured in the Mississippi Delta, La.

Sagittaria papillosa Buch. Common. Flowers and immature fruit, October 30, 1910; mature fruit, January 14 and October 30.

Sagittaria latifolia Willd. Introduced from Carleton, Ore.

ELEOCHARIDACEAE.

Vallisneria spiralis L. Abundant. Introduced from Currituck Sound, N. C., and Oshkosh, Wis.

POACEAE.

Erianthus saccharoides Michx. Mature fruit, November 2.

Schizachyrium maritimum (Chapm.) Nash. Immature fruit, October 30. The fleshy root stock is usually about 4 inches beneath the surface.

Andropogon glomeratus (Walt). B. S. P. Mature fruit, October 30. This is a conspicuous plant just back of the beach and in open places generally.

Andropogon capillipes Nash. Immature fruit, October 30.

? Sorghastrum linneanum (Hack.) Nash. Grain fallen, October 30.

Paspalum distichum L.

Paspalum vaginatum Sw. Immature fruit, October 30.

Syntherisma sanguinale (L.) Dulac. Ripe fruit, some fallen, October 30.

Echinochloa crus-galli (L.) Beauv. Ripe fruit, October 30.

Echinochloa walteri (Pursh.) Nash. Ripe fruit, October 30.

Panicum virgatum L. Ripe fruit, mostly fallen, October 31.

Panicum amarulum Hitchc. and Chase. Abundant on the crest of the beach. Seeds said to be a good dove food. Immature fruit, October 30.

Panicum arvnicoloides Ashe. Grain hard but the glumes still green, October 31.

Panicum erectifolium Nash. Ripe fruit, mostly fallen, October 31.

Panicum commutatum Schult. Nearly mature fruit, October 30.

Sacciolepis striata (L.) Nash. In flower, October 30.

Chaetochloa imberbis (Poir.) Scribn. Nearly mature fruit, October 31, November 6; quite ripe, October 30.

Chaetochloa viridis (L.) Scribn. Ripe fruit, October 30.

Chaetochloa magna (Griseb.) Scribn. Ripe fruit, October 30, 1910. Also October 8, 1911, when blackbirds and teal were observed feeding upon it.

Cenchrus carolinianum Walt. Both immature and mature fruits, November 2. One fact relating to this plant, while not of botanical interest, is none the less marvelous. It is almost inconceivable that any animal can eat a plant filled with the well defended fruits that characterize *Cenchrus*. The spines strike into human flesh at the least chance and are hard to pull out; one would think no mucous membrane could possibly endure them. Yet cattle and especially mules munch them down in perfect unconcern.

Zizania aquatica L. Introduced from northern Minnesota, Oshkosh, Wis., and the Apalachicola River, Fla. Little success was had except with the last lot. Seed ripening, October 8, 1911.

Oryza sativa L. One small colony which probably originated from some waste stock food, appears to be well established.

?Aristida mohrii Nash. Covers hundreds of acres. Both immature and mature fruit, November 2.

Aristida gyrans Chapm. Ripe fruits, mostly fallen, October 31.

Aristida spiciformis Ell. Both immature and mature fruits, November 4.

Muhlenbergia filipes M. A. Curtis. This grass covers large areas just back of the beach, and its purple tops form veritable clouds of color. Plants not yet in bloom, and others with ripe seeds were found on October 30.

Sporobolus indicus (L.) R. Br. Ripe fruits, October 30.

Capriola dactylon (L.) Kuntze. Running in sand, the leaves barely exserted from the sheaths, November 1.

Spartina glabra Muhl.

Spartina bakeri Merrill. Grain formed but not filled, October 30.

Chloris petraea (Sw.) Desv. Fruits mature, mostly fallen, October 30.

Leptochloris fascicularis (Lam.) A. Gray. Both immature and mature fruits, October 31.

Monanthochlöe littoralis Engelm. Seeds found in several duck gizzards collected January, 1911.

Phragmites phragmites (L.) Karst. Cane. Immature fruits, October 31.

Eragrostis probably *refracta* (Muhl.) Scribn. All fruits had fallen from the tall culms of a clump collected October 30, while a short new stalk from the roots bore immature seeds.

Uniola paniculata L. Sea oats.

CYPERACEAE.

Cyperus compressus L. Ripe akenes, October 30.

Cyperus virens Michx. Akenes fallen, January 9.

Cyperus surinamensis Rottb. Ripe akenes, October 30.

Cyperus haspan L. Ripe akenes, mostly fallen, October 30.

Cyperus esculentus L. In flower, October 31.

Cyperus ferax Vahl. Ripe akenes, October 30.

Cyperus cylindricus Boeckl. Ripe akenes, mostly fallen, October 31.

Cyperus echinatus (Ell.) Wood. Akenes fallen, October 31; akenes hardly formed, November 2.

Fuirena scirpoidea Michx. Akenes fully ripe, November 2.

Fuirena hispida Ell. Akenes fully ripe, November 2.

Scirpus americanus Pers. Akenes fully ripe, November 2.

Scirpus validus Vahl. In flower, October 31.

Scirpus lacustris L. Ripe akenes, January 10.

Scirpus robustus Pursh. Akenes fully ripe, November 6, partly fallen, October 31, mostly fallen, January 14.

Eleocharis cellulosa Torr. Ripe akenes, November 1.

Eleocharis acicularis (L.) R. & S. Unopened flowers, October 31.

Eleocharis albida Torr. Ripe akenes, October 31.

Fimbristylis spadicea (L.) Vahl. Akenes partly fallen, October 30; nearly all fallen, January 7.

Fimbristylis castanea (Michx.) Vahl. Akenes mostly fallen, October 31.

Fimbristylis frankii Steud. Ripe akenes, October 31.

Stenophyllus capillaris (L.) Britton. Ripe akenes, October 31.

Psilocarya nitens (Vahl.) Wood. Spikes half bare, November 2.

Dichromena colorata (L.) Hitchc. Ripe akenes, October 30.

Cladium effusum (Sw.) Torr. Saw grass. Fringes all bodies of water on the island. Ripe akenes, January 7 to 14.

Rhynchospora corniculata (Lam.) A. Gray. Both immature and mature akenes, November 2.

Rhynchospora fascicularis (Michx.) Vahl. Ripe akenes, November 2.

Rhynchospora dodecandra Baldw. Ripe akenes, mostly fallen, November 2.

Rhynchospora caduca Ell. Ripe akenes, November 2.

Rhynchospora microcarpa Baldw. Ripe akenes, October 31.

Scleria triglomerata Michx. Akenes fallen, October 30.

Scleria reticularis Michx. var. *pubescens* Britton. Ripe akenes, November 2.

ARECACEAE.

Sabal palmetto (Walt.) R. & S. Abundant.

Serenoa serrulata (Michx.) Hook. Abundant.

ARACEAE.

Orontium aquaticum L.

LEMNACEAE.

Lemna present, species undetermined.

XYRIDACEAE.

Xyris iridifolia Chapm. Ripe seeds, November 2.

Xyris arenicola Small. Ripe seeds, November 2 and 4.

ERIOCAULACEAE.

Ericaulon decangulare L.

COMMELINACEAE.

Tradescantia virginiana L. Flowers and ripe seeds, October 31.

PONTEDERIACEAE.

Heteranthera reniformis R. & P.

Pontederia cordata L. Flower buds, October 30; seeds in duck stomachs, January 9.

BROMELIACEAE.

Dendropogon usneoides (L.) Raf. Ripe capsules, October 31.

JUNCACEAE.

Juncus aristulatus Michx. Ripe seeds, October 31.

Juncus megacephalus M. A. Curtis. Ripe seeds, October 30.

Juncus scirpoides Lam. Ripe seeds, November 2 and January 7.

DRACAENACEAE.

Yucca recurvifolia Salisb. Old fruits on ground, seeds intact, June, 1912.

Yucca aloifolia. Ripe seeds, November 6.

SMILACACEAE.

Smilax bona-nox L. Ripe fruit, November 2.

Smilax beyrichii Kunth. A conspicuously abundant plant. Much browsed by deer.

HAEMADORACEAE.

Gyrotheca tinctoria (Walt.) Salisb. Ripe seeds, November 2.

CANNACEAE.

Canna flaccida Roscoe. Ripe seeds, November.

MARANTACEAE.

Thalia divaricata Chapm. Flowers, November 2; flowers and ripe seeds, October 31; seeds fallen, January 9. Transplanted by roots with fair, and by the seeds with excellent success.

SAURURACEAE.

Saururus cernuus L.

JUGLANDACEAE.

Hicoria ovata (Mill.) Britton.

Hicoria glabra (Mill.) Britton.

MYRICACEAE.

Morella pumila (Michx.) Small.

Morella cerifera (L.) Small. Ripe fruit, October 31.

SALICACEAE.

Salix longipes Shuttlew.

FAGACEAE.

Quercus laurifolia Michx. Water oak. Mature acorns, October 30. A tree 10 to 12 inches in diameter was observed to bear exclusively leaves of the pinnatifid type said to be characteristic of shoots (specimen No. 1743B).

Quercus minima (Sarg.) Small.

Quercus virginiana Mill.

POLYGONACEAE.

Rumex hastatulus Baldw. In flower, October 30.

Polygonella brachystachya Meisn. In flower, November 2.

Polygonella gracilis (Nutt.) Meisn. Flowers and immature akenes, October 30.

Persicaria lapathifolia (L.) S. F. Gray.

Persicaria punctata (Ell.) Small. Flowers and immature fruit, October 30 to November 2; mature akenes, October 30; flowers only, October 31 and January 9.

Tracaulon sagittatum (L.) Small. Seeds in duck gizzards, January 10.

CHENOPODIACEAE.

Atriplex arenaria Nutt. Abundance of mature fruits, November 1.

Salicornia ambigua Michx. Seeds fallen, November 2.

AMARANTHACEAE.

Acnida cannabina L. var. *australis* A. Gray. Immature fruits, October 30.

Acnida tuberculata Moq. Both flowers and ripe fruits collected, October 30.

Froelichia floridana (Nutt.) Moq.

CORRIGIOLACEAE.

Odontonychia erecta (Chapm.) Small.

TETRAGONIACEAE.

Mollugo verticillata L. (?) The single specimen collected combines the characters of *verticillata* and *cerriana*, having linear to oblong and spatulate leaves, and the seeds faintly ridged as well as reticulated. Ripe capsules, October 31.

Sesuvium portulacastrum L. Ripe fruit, November 1.

CERATOPHYLLACEAE.

Ceratophyllum demersum L. Seeds in duck stomachs, January 10. Chapman records* *C. echinatum* A. Gray from St. Vincent. It is probable that little harm would be done by regarding all Ceratophyllums in North America as belonging to a single variable species.

MAGNOLIACEAE.

Magnolia foetida (L.) Sarg. Numerous trees are present on the south side of the island.

NELUMBONACEAE.

Nelumbo lutea (Willd.) Pers. Several acres in one of the ponds are occupied by this plant. Ripe seeds, partly fallen, October 8, 1911.

NYMPHEACEAE.

Castalia odorata (Dryand) Woodv. and Wood. For the present all of the water lilies collected are placed under this name. There seem to be two kinds, however, one with larger leaves, the edges of which are coarsely toothed, and with larger flowers on stouter peduncles. Seeds in duck stomachs, January 10.

Castalia mexicana Znec. Introduced.

BRASSICACEAE.

Cakile edentula (Bigel.) Hook. Ripe fruits, leaves fallen, November 1.

ROSACEAE.

Rubus trivialis Michx.

CASSIACEAE.

Chamaecrista bellula Pollard. Both flowers and ripe fruit, October 30. Originally described† from St. Vincent specimens (September 9, 1899, S. M. Tracy).

FABACEAE.

Lupinus diffusus Nutt. Lavender. Seeds fallen, October 31.

Sesban macrocarpa Muhl. Coffee weed. Ripe pods, October 30.

Amorpha fruticosa L. Ripe pods, November 2.

Meibomia stricta (Pursh) Kuntze. Pods full sized but not filled, November 2.

* Flora of the Southern U. S., 1860, p. 398.

† Proc. Biol. Soc. Wash., 15, 1902, pp. 19–20.

Meibomia paniculata pubens (T. & G.) Vail. Ripe pods, October 30.
Meibomia viridiflora (L.) Kuntze. Ripe pods, October 30, 31.
Lespedeza hirta (L.) Ell. Ripe pods, October 30.
Lespedeza capitata Michx. Ripe pods, November 2.
Dolicholus minimus (L.) Medic. Ripe pods, November 2.
Erythrina herbacea L. Coral vine. Ripe pods, January 16.
Galactia regularis (L.) B. S. P. Ripe pods, November 2.
Galactia volubilis (L.) Britton. Ripe pods, November 2.
Bradburya virginiana angustifolia (Griseb.) Small. Ripe pods, October 31.
Canavalia obtusifolia (Lam.) D. C. Sea bean. Both flowers and ripe pods, November 6. Recorded from St. Vincent by Chapman.*
Vicia acutifolia Ell. Flowers and immature pods, November 6.

OXALIDACEAE.

Oxalis cymosa Small.

RUTACEAE.

Fagara clava-herculis (L.) Small.

POLYGALACEAE.

Polygala brevifolia Nutt. Flowers and ripe seed, November 2.
Polygala lutea L. Flowers, November 4.
Polygala baldwinii Nutt. Flowers, November 2.

EUPHORBIACEAE.

Croton punctatus Jacq. Dove-weed. So called because mourning doves are very fond of the seeds. Ripe seeds, October 30.
Acalypha virginica L. Nearly ripe seeds, October 30.
Stillingia aquatica Chapm.
Cnidoscolus stimulosus (Michx.) A. Gray. Flowers, November 5, ripe seeds, October 30.
Chamaesyce maculata (L.) Small. Immature fruits, October 30.
Chamaesyce nutans (Lag.) Small. [*hypericifolia*]. Flowers and immature fruits, November 6.

EMPETRACEAE.

Ceratiola ericoides Michx.

ANACARDIACEAE.

Rhus radicans L. Seeds in duck gizzards, January 10.
Rhus copallina L. Ripe fruit, October 30.

AQUIFOLIACEAE.

Ilex glabra (L.) A. Gray. Gall berry; gall ring berry. Both immature and mature fruit, November 2; ripe fruit, November 4.
Ilex vomitoria Ait.
Ilex opaca Ait. Only two clumps known on the island. Fruit not quite ripe, November 4.

VITACEAE.

Vitis rufotomentosa Small.

* Flora 1860, p. 109.

Cissus incisa Desmoul. Recorded by Chapman;* fruits in November.
Ampelopsis arborea (L.) Rusby. Ripe fruit, October 31.

MALVACEAE.

? Hibiscus incanus Wendl. Wild cotton. Seeds fallen, October 30.

HYPERICACEAE.

Ascyrum hypericoides L. Ripe capsules, October 30.
Ascyrum tetrapetalum (Lam.) Vail. Flowers, immature and mature capsules, October 30.
Ascyrum linifolium Spach.
Hypericum ambiguum Ell. All stages from flowers to ripe capsules, November 4.

CISTACEAE.

Lechea minor L. Ripe capsules, October 30.

OPUNTIACEAE.

Opuntia pes-corvi Le Conte.

LAURACEAE.

Persea borbonia (L.) Spreng.
Persea pubescens (Pursh.) Sarg. Ripe fruit, November 2.

LYTHRACEAE.

Ammannia coccinea Rottb. Both immature and mature fruits, October 31 and November 3.

ONAGRACEAE.

Isnardia palustris L.
Ludwigia alternifolia L. Ripe capsules, October 31.
Oenothera humifusa Nutt. All stages from flowers to mature fruit, November 2.
Gaura angustifolia Michx. Immature fruit, October 30.

GUNNERACEAE.

Proserpinaca pectinata Lam.
Myriophyllum. Present, species not determined.

UMBELLIFERAE.

Hydrocotyle umbellata L.
Hydrocotyle ranunculoides L.
Centella repanda (Pers.) Small.

ERICACEAE.

Kalmia hirsuta Walt. All stages from flowers to opened capsules, November 4.
Zenobia pulverulenta (Willd.) Pollard.
Pieris nitida (Bartr.) B. & H. Ripe capsules, November 2.
Xolisma fruticosa (Michx.) Nash.

VACCINIACEAE.

Gaylussacia dumosa (Andr.) T. & G.
Gaylussacia frondosa (L.) T. & G.

* Flora 1860, p. 70.

Batodendron arboreum (Marsh.) Nutt.
Polycodium stamineum (L.) [*sensu late*]. Flowers, October 30.
Vaccinium myrsinites Lam.

ARMERIACEAE.

Limonium nashii Small. Flowers, November 3. This form seems to be little if any different from *carolinianum*.

EBENACEAE.

Diospyros virginiana L.

OLEACEAE.

Osmanthus americana (L.) B. & H. Black haw.

SPIGELIACEAE.

Polypremum procumbens L. Seeds fallen, October 30.

GENTIANACEAE.

Sabbatia dodecandra (L.) B. S. P. Flowers, November 4.

CONVOLVULACEAE.

Ipomoea littoralis (L.) Boiss.
Ipomoea pes-caprae (L.) Sweet. Railroad vine. This vine grows on the beach as near the water as it is able to maintain itself, and upon the first ridge back of the beach. It is an efficient sand binder. Nearly mature fruit, October 30.
Ipomoea speciosa Walt. Mature fruit, October 30.

CUSCUTACEAE.

Cuscuta compacta Juss. Flowers, November 2.

SOLANACEAE.

Physalis angulata L. Mature fruit, October 30.
Physalis angustifolia Nutt. Both immature and mature fruits, November 1.

HELIOTROPACEAE.

Heliotropium indicum L. Seeds found in duck stomachs, collected January, 1910.

VERBENACEAE.

Verbena urticaefolia L. Mature fruit, October 31.
Callicarpa americana L.

LAMIACEAE.

Teucrium nashii Kearney. Flowers, October 31 and November 6; mature akenes, October 31.
Trichostema dichotomum L. Akenes ripe, mostly fallen, October 31.
Monarda punctata L. Flowers, October 31.
Conradina canescens (T. and G.) A. Gray. Flowers, October 30.
Mesosphaerum rugosum (L.) Pollard. Akenes fallen, November 2.

RHINANTHACEAE.

Monniera monniera (L.) Britton. Ripe capsules, October 30.
? Gerardia plunkenetii Ell. Flowers and dehisced capsules, October 31.
Gerardia setacea Walt. Flowers and dehisced capsules, November 4.

Pinguiculaceae.

Utricularia oligosperma St. Hil. Flowers, October 30.

?Utricularia gibba L. Flower buds, October 30.

Utricularia macrorhyncha Barnhart. Flowers and ripe capsules, October 30.

Rubiaceae.

Cephalanthus occidentalis L. Immature fruits, October 30.

Diodia teres Walt. Carpets areas once cultivated and is common elsewhere. Ripe fruits, October 30.

Galium hispidulum Michx. Ripe fruits, November 1.

Lobeliaceae.

Lobelia brevifolia Nutt. Flowers and ripe capsules, November 2.

Ambrosiaceae.

Ambrosia artemisiifolia L. Flowers, October 30.

Iva frutescens L. Horse brush. Abundant along narrow channels; rather easily killed by a rise in the level of the water. All stages from flowers to nearly mature akenes, November 1.

Cardiaceae.

Eupatorium serotinum Michx. Ripe akenes, October 30.

Eupatorium sp. nov.? (No. 1781 A). With opposite, petioled leaves which are several times longer than broad, this species comes near *serotinum*, but the leaves are almost entire, being merely undulate. Flowers to ripe akenes, some fallen, October 31.

Eupatorium mikanioides Chapm. Akenes practically all fallen, October 30. Originally described from St. Vincent.*

Eupatorium tortifolium Chapm. Immature akenes, November 2.

Eupatorium rotundifolium L. Ripe akenes, November 2.

Willaubaeya scandens (L.) Kuntze. Flowers to ripe akenes, October 30.

Trilisa odoratissima (Walt.) Cass. Flowers to ripe akenes, November 2.

Laciniaria tenuifolia (Nutt) Kuntze. Both immature and mature akenes, November 2.

Laciniaria chapmanii (T. & G.) Kuntze. Flowers and immature akenes, October 30.

Heterotheca subaxillaris (Lam.) Britt & Rusby. All stages from flowers to bare receptacles, October 30.

Chrysopsis graminifolia (Michx.) Nutt. Flowers to immature akenes, November 2.

Chrysopsis decumbens Chapm. Flowers to immature akenes, October 30. Originally described from St. Vincent.†

Chrysoma pauciflosculosa (Michx.) Greene. Immature akenes, October 30.

Euthamia graminifolia (L.) Nutt. Immature akenes, October 30.

* Flora 1860, p. 195.

† Flora 1860, p. 217.

Solidago chrysopsis Small. Flowers, October 30.

Solidago stricta Ait. Flowers to ripe akenes, October 30 and November 3.

Solidago angustifolia Ell. Flowers to ripe akenes, October 30. Flowers, January 11.

Solidago chapmani A. Gray. Flowers to ripe akenes, October 30.

Aster coridifolius Michx. Flowers to ripe akenes, November 2.

Aster exilis Ell. Flowers to ripe akenes, October 30.

Baccharis halimifolia L. Flowers, October 30; ripe akenes, October 31.

Baccharis angustifolia Michx. Ripe akenes, November 2.

Pluchea foetida (L.) B. S. P. Ripe akenes, many fallen, October 30.

Pluchea imbricata (Kearney) Nash. Flowers to immature akenes, October 30.

Pluchea petiolata Cass. Flowers to immature akenes, October 30.

Gnaphalium obtusifolium L. Ripe akenes, October 30.

Borrichia frutescens (L.) D. C. Ripe akenes, November 3.

Helianthus debilis Nutt. Flowers to ripe akenes, October 30.

Coreopsis longifolia Small. Flowers to ripe akenes, November 2.

Bidens cernua L. Flowers to ripe akenes, October 30. Colonies of this plant made beautiful yellow spots in the sombre green marsh.

Erechtites hieracifolia (L.) Raf. Ripe akenes, many receptacles bare, October 30 and November 6.

Vol. XXVI, pp. 53–56 March 22, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW SUBSPECIES OF *RANA PRETIOSA* FROM NEVADA.

BY HELEN B. THOMPSON,

Museum of Natural History, University of Michigan.

During the summer of 1912 the Walker-Newcomb Expedition to northeastern Nevada collected a series of frogs which are closely related to *Rana pretiosa*, but which differ from the typical form in structure and in coloration sufficiently to require subspecific recognition. I am indebted to Dr. Alexander G. Ruthven, Head Curator of the Museum, for permission to publish this description, and to Dr. Leonhard Stejneger for the loan of specimens of *Rana pretiosa* from the collection of the U. S. National Museum.

Rana pretiosa luteiventris subsp. nov.

Diagnosis.—Form as in *Rana pretiosa*. Head broader than long; tympanum smaller than eye; vomerine teeth in two oblique patches extending behind internal nares. Lateral folds inconspicuous. Heel of extended hind limb reaching between middle of tympanum and end of snout; small inner metatarsal tubercle, no tubercle at base of fourth toe; palmar tubercle indistinct or lacking. Color above varying from bright to dark yellowish brown on upper surface; back between lateral folds with few or many irregular dark blotches; under surface anteriorly whitish mottled with grey, posteriorly orange yellow.

Habitat.—Humboldt and Maggie Valleys in Maggie Basin, Eureka and Elko Counties, Nevada.

Type-specimen.—Museum of Natural History, University of Michigan, Cat. No. 43,037; Anne Creek, Elko Co., Nevada; July 16, 1912; Crystal Thompson, collector.

Description of type-specimen.—Form stout. Head broader than long; snout rounded; external nares small and round, nearer end of snout than eye; eye small; tympanum small, three-fifths the size of the eye; tongue large and fleshy, strongly notched behind; vomerine teeth extend-

ing back in two oblique patches from the inner edge of the internal nares. Skin roughly tubercular; sides, outer surface of leg and lower surface of foot covered with small pointed granules; lateral folds inconspicuous; glandular ridge along the jaw, interrupted at the angle of the jaw and at the shoulder by a ridge curving behind the tympanum; fold of skin across the chest. Fingers not webbed, first slightly longer than second, palmar tubercle indistinct. Legs massive, length to heel equaling that of body forward to anterior corner of eye; foot broadly webbed, terminal joint of fourth toe free; small inner metatarsal tubercle, no outer tubercle (Pl. III, Fig. 2). Color above greyish brown; a few irregular dark spots between lateral folds; a light glandular ridge along the jaw; sides grey, tubercles tipped with light; limbs obscurely mottled with dark; under surface whitish, mottled with dark anteriorly, orange yellow (171)* posteriorly.

Notes on paratypes.—There is little individual variation in the series of forty-seven specimens examined, except in coloration and the length of the hind limb. In the brighter colored specimens the lateral folds are lighter than the ground color. There is occasionally a trace of a dark cheek patch, and the spots on the back may be obscure or distinct and few or many in number. The bright color on the ventral surface varies from a faint yellowish tinge on the feet of the young specimens to orange yellow (141, 156, 161, 171) in adults, and it may be present on the thighs, may extend in a more or less U-shaped blotch on the belly, or may cover the entire ventral surface to the shoulder girdle.

Description of tadpole.—(No. 43,073, Museum of Natural History, University of Michigan, collected July 10.) Length of body, 34 mm.; width, 22 mm.; length of tail, 67 mm.; height, 13 mm. Nostrils nearer eyes than end of snout, distance between them half the interocular space. Spiraculum sinistral. Anal opening dextral in caudal crest. Legs well developed, with small but distinct tubercle at base of fourth toe. Labial papillae interrupted in center above, series of labial teeth $\frac{2}{4}$, second upper series interrupted in middle (Pl. III, Fig. 3). Color in alcohol brownish grey above, with lateral folds a little lighter; belly greyish white; muscular part of tail yellowish white with small grey spots; caudal crests grey with darker spots.

Remarks.—*Rana pretiosa luteiventris* may be readily distinguished from *Rana pretiosa* by the difference in coloration and the absence of the tubercle at the base of the fourth toe in the mature stage (cf. Figs. 1 and 2, Pl. III). Also the palmar tubercle is either lacking or much less distinct than that of the typical form, as shown in Figs. 1 and 2, Pl. III, and as figured by Dickerson† and Cope.‡

Habitat and habits.—This species was common in the irrigation ditches along Anne Creek, in Anne Creek, in the oxbow ponds in Maggie Canyon, and a few were found in Maggie Creek below the canyon, in Susan Creek and the Valley of the Humboldt River, in Maggie Basin. It is quite

* Klincksieck et Valette, Code des Couleurs, Paris.

† The Frog Book, Color Plate XVI.

‡ Batrachia of North America, Bull. 34, U. S. Nat. Mus., p. 434.

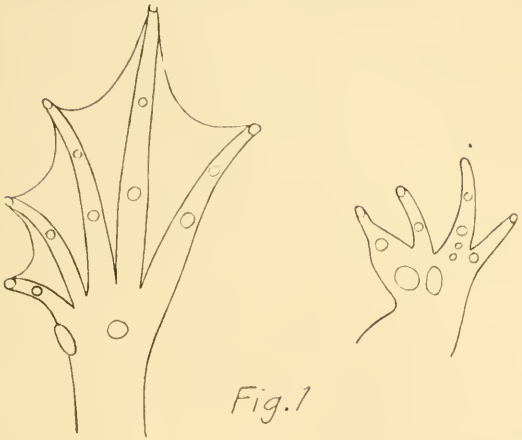

Fig. 1

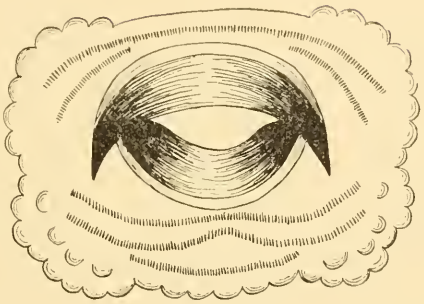

Fig. 3

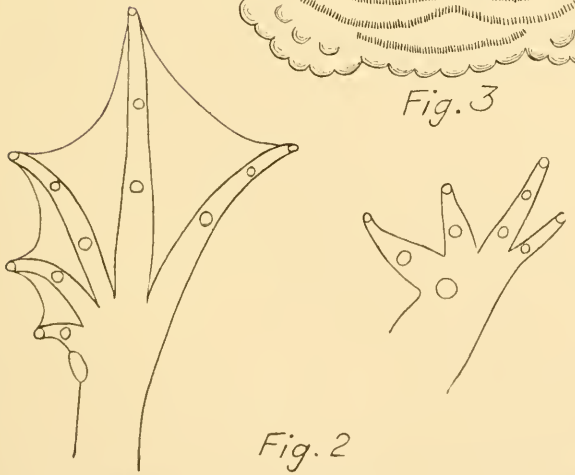

Fig. 2

Fig. 1.—*Rana pretiosa*, No. 26,001, U. S. National Museum. Foot and hand.

Fig. 2.—*Rana pretiosa luteiventris*, No. 43,037 (type), Museum of Natural History, University of Michigan. Foot and hand.

Fig. 3.—*Rana pretiosa luteiventris*, No. 43,073, Museum of Natural History, University of Michigan. Mouth of tadpole.

aquatic, although the stomach contents, consisting of ants and water insects, indicate that at least part of the hunting is done on land. A few young specimens were taken a short distance from water on the banks of Anne Creek, but the adults were usually found along the edges of swiftly flowing streams or with only the head projecting from the vegetation of stagnant pools. When disturbed, they slipped quietly under the surface, but quickly reappeared, usually in the same place. Although they were almost as common as *Rana pipiens*, the two species were seldom found in the same pond.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE NAME OF THE ROCKY MOUNTAIN SHEEP.

BY WILFRED H. OSGOOD.

For nearly twenty years there has been an unfortunate lack of uniform usage respecting the name of the Rocky Mountain Sheep. Owing to the size and importance of the animal, it is referred to in many works of sport and travel, and since it has been divided into numerous geographical races, its name is of frequent occurrence in various classes of zoölogical publications. Therefore agreement as to its scientific name is more than usually desirable. The names used for it in recent years are *Ovis canadensis* and *Ovis cervina*, which, as now seems proved, are of even date and subject to fairly definite rules; but the habit of disagreement has become so fixed that it continues to afflict, possibly because the claims of *canadensis* for recognition have not been stated at such length as those of *cervina*. A third name, *Ovis montana*, although not used recently, now proves to be of the same date as the others, so this also is involved.*

As usual in such cases, the facts became known gradually and decisions made at different periods have had some effect upon opinions rendered in the face of later developments. All three names refer exclusively to one animal, the *Belier de Montagne* of Geoffroy, which was in turn based on the Mountain Ram of MacGillivray. Cuvier and most subsequent authors until 1880 used *Ovis montana*, citing it from 1817. In 1880 Alston† found that *O. montana* Cuvier 1817 was preoccupied by *O. montana* Ord 1815, based on the mountain goat, a different animal; therefore he abandoned it for the mountain sheep and adopted *O. cervina*, which he cited from Desmarest 1818. Five years

* See Hollister, Proc. Biol. Soc. Wash., XXV, pp. 185–188, Dec. 24, 1912.

† Biolog. Cent. Amer., p. 111, 1880.

later, Biddulph* adopted *canadensis*, citing it from Shaw 1804 and claiming priority for it over *cervina* which he believed to date from 1818. He obtained the date 1804 not from the title page but from an estimate based upon assumed regularity of issue of the parts of the Naturalists' Miscellany, the work in which the name appeared. He was thus the first modern author to use any of the three names upon the basis of its real date as we now know it. The burden of proof, therefore, rested upon names subsequently brought forward. Apparently in this belief, Merriam in 1890† and 1891,‡ adopted *canadensis*. In April, 1895, Sherborn§ published a careful collation of the parts of the Naturalists' Miscellany in which he more than corroborated the date obtained by Biddulph for *canadensis* since he made it appear that in all probability it was published in December, 1803. In spite of this, Allen‖ in June of the same year rejected *canadensis* in favor of *cervina* which he cited from its original source bearing the date 1804 on its title-page. He based this action upon his personal doubt of the date December, 1803. He readily admitted that the name must in any case have appeared early in 1804, thus making it of even date with *cervina*, but he chose *cervina* in preference to *canadensis* because he regarded a title-page date more reliable than one ascertained from other sources. Dr. Allen's views were followed in some quarters but in others his mere expression of doubt was not accepted as evidence. Those who continued to use *canadensis* did so on the ground that to the best of their knowledge it was published in December, 1803, and therefore antedated *O. cervina*, which lacked even a pretension to publication prior to 1804. A title-page date had no sanctity to them for they knew it might be called in question as well as one determined by investigation. That is, Sherborn's determination of 1803 as the date of *O. canadensis* stood accepted in the absence of proof to the contrary and in the last analysis no more could be said of the later title-page date of *O. cervina*. It was evident, moreover, that a subsequently discovered error in the collation of Shaw's work could

* Proc. Zool. Soc. Lond., pp. 681–684, 1885.

† N. Amer. Fauna No. 3, p. 78, Sept. 11, 1890.

‡ N. Amer. Fauna, No. 5, p. 81, July, 1891.

§ Ann. & Mag. Nat. Hist. (6), xv, p. 376, 1895.

‖ Bull. Am. Mus. Nat. Hist., VII, p. 258, footnote, June 29, 1895.

only throw the date of *canadensis* forward to 1804, which would make it at least of even date with *cervina*.

The existence of such an error is now shown by an exhaustive reexamination of all the literature set forth by Dr. J. A. Allen in a paper* the main point of which is the discovery that one of the volumes of the Naturalists' Miscellany closed in July instead of August, therefore indicating that the part containing the name *Ovis canadensis* did not appear until January or February, 1804, instead of December, 1803, as previously supposed. Although Dr. Allen has not so regarded it, the importance of this discovery seems to lie in the fact that the matter was changed from one of priority to one of the treatment of names of even date. The question of dates is now thoroughly sifted and it seems extremely unlikely that it will ever be possible to go behind Dr. Allen's evidence, which is to the effect that both names appeared early in 1804, and that beyond this nothing can or ever will be known. His words (loc. cit., p. 2) are:

> "The present paper originated in an attempt to settle the question of priority between the names *Ovis cervina* Desmarest and *Ovis canadensis* Shaw, both of which prove to have been published early in the year 1804."

Again (p. 11):

> "The careful collation of Shaw and Nodder's work given below shows that the actual date of publication of this name [*canadensis*] was almost unquestionably February, 1804, and could not have been in 1803."

His conclusion, however, is the same as his former one and he continues to urge the adoption of the name *cervina* because of its title-page date. Although little more than a year has passed, usage has again failed to conform to his interpretation and we still have some authors using *cervina* and others *canadensis*. Thus, Grinnell† has employed *cervina*, while Bailey‡ and Miller§ show their preference for *canadensis*. The case for *canadensis* seems sufficiently covered by the fact of its current use at the time *cervina* was first cited from 1804 by a modern author. This being the case, the attempt to displace it violated

* Bull. Am. Mus. Nat. Hist., xxxi, pp. 1–29, Mar. 1, 1912.
† Univ. Calif. Pubs., Zool., X, pp. 113–153, May 9, 1912.
‡ Proc. Biol. Soc. Wash., xxv, pp. 109–110, June 29, 1912.
§ U. S. Nat. Mus., Bull. 79, p. 395, Dec. 31, 1912.

the general principle that a name should not be changed except upon absolutely convincing evidence. However, even if we disregard this and attempt to settle the case by reference to a specific code rule we are again forced to choose *canadensis*. Article 28 of the International Code of Zoölogical Nomenclature is the only one bearing upon it. This reads as follows:

"Art 28. A genus formed by the union of two or more genera or subgenera takes the oldest valid generic or subgeneric name of its components. If the names are of the same date, that selected by the first reviser shall stand. The same rule obtains when two or more species or subspecies are united to form a single species or subspecies.

"*Recommendation.*—In absence of any previous revision, the establishment of precedence by the following method is recommended:

"(*a*) A generic name * * *

"(*b*) A specific name accompanied by both description and figure stands in preference to one accompanied only by a diagnosis or only by a figure.

"(*c*) Other things." * * *

It is evident that the first reviser principle can not apply to cases of this kind, for all the early authors were unaware of the facts and never had in mind the idea of revision in the sense of selection, being wholly concerned with priority. Thus in 1880 Alston (l. c.) adopted *cervina* over *montana*, but on the erroneous suppositions that one dated from 1818 and that the other was preoccupied. Again, Biddulf (l. c.) in 1885 gave preference to *canadensis* after finding its date to be 1804, but he too had no date for *cervina* earlier than 1818. Even Allen's paper of 1912 can not be called full revision, because he considered only the names *cervina* and *canadensis*, believing *montana* to date from 1816 and therefore to be negligible. Upon the basis of mere adoption, it would be necessary to select *montana*, its use by Tiedemann in 1808 being the first subsequent to 1804. It is obvious, however, that a reviser can not qualify as such in a matter of names of even date unless he is aware that the dates really are even. Moreover, it is well understood that the main provisions of Article 28 are aimed at a class of cases very different from the present one; but Recommendation (*b*) of this article is clear and definite and evidently intended for cases of any kind not previously covered. This brings us definitely to the selection of *Oris canadensis*, for this

name appears with both text and figure, whereas, *montana* has only a figure and *cervina* only a diagnosis.

The facts of first importance regarding the three names may be summarized as follows:

(1) *Ovis canadensis* was first published, with description and figure, early in 1804. An exact date is not ascertainable. This information was obtained by collation of parts of the work in which it appeared and reference to contemporaneous literature by bibliographers of the highest rank. There is no more reason to doubt this date than that of any other work without title-page imprint, and unless all such are to be rejected, it must be accepted. This name was the first to be used by modern authors upon the basis of its real date and therefore should stand, unless it can be proved that some other name has priority over it. This has not been done. Moreover, by Recommendation (*b*), Article 28, International Code of Zoölogical Nomenclature, the selection of this name is imperative.

(2) *Ovis cervina* was first published, with description only, in the year 1804, as indicated by a title-page imprint. An exact date is not ascertainable. Attempts to substitute this name for *canadensis* never have shown its prior publication.

(3) *Ovis montana* was first published, with figure only, in the year 1804. An exact date is not ascertainable. This information was obtained by bibliographic investigation, since the plate was not dated. Its use is open to the same objections as that of *cervina*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW HUMMINGBIRD OF THE GENUS *CHLOROSTILBON* FROM BRAZIL.

BY J. H. RILEY.

[By permission of the Secretary of the Smithsonian Institution.]

While arranging the collection of hummingbirds belonging to the U. S. National Museum, I ran across three specimens belonging to the genus *Chlorostilbon* that I have been unable to identify and have reached the conclusion that they belong to an undescribed species. It may be known as:

Chlorostilbon puruensis sp. nov.

Type.—U. S. National Museum, No. 177,034, adult male, Hyutanihan, just below falls of the Purus River, Brazil, March 24, 1910. Collected by J. B. Steere.

Characters.—Differs from *Chlorostilbon prasinus daphne* in the darker tone of the green above, in the bluish tinge on the chin, in the brighter and more brilliant green below, in the longer bill, which is also brownish on the lower mandible (black in *C. p. daphne*), and in having a longer tail.

Description.—Above bright green with coppery reflections, duller on the top of the head and upper tail-coverts; chin bluish green; throat, breast and abdomen brilliant, shining coppery green; the belly and flanks with some white cottony feathers, mostly concealed; under tail-coverts nearest bottle green; tail steel blue; wing coverts color of the back; flight feathers purplish blue; upper mandible black, lower mandible brownish, except at extreme tip (probably dull reddish in life). Wing, 47.5; tail, 29; culmen, 18 mm.

Remarks.—This fine species is founded upon an immature and two adult males, all from the type locality. The other adult is molting and somewhat duller than the type; the culmen measures 19.5 mm. Five adult males of *C. p. daphne* average: wing, 46.1; tail, 21.8; culmen, 16.1 mm. I have not a specimen of typical *C. p. prasinus*, but judging from descriptions and the closely related forms, the species is quite distinct. Lesson's type of *Ornismya prasina* most likely came from the coast of Brazil and not from the interior.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENERIC NAME FOR THE ASIATIC TAPIR.

BY E. A. GOLDMAN.

Comparison of the skulls of the American and Asiatic tapirs indicates that the existing members of the family *Tapiridae* are divisible by cranial characters into three nearly coordinate groups which may be regarded as generic in rank. These are *Tapirus* Brisson, the type of which is *Hippopotamus terrestris* Linnæus, from Brazil; *Tapirella* Palmer, with *Elasmognathus bairdii* Gill, from the Isthmus of Panama, as type; and a third group typified by the species currently recognized as *Tapirus indicus* Desmarest, from Asia. The generic name *Rhinochoerus* must be disregarded as it was proposed by Wagler to replace *Tapirus* because the latter was not derived from a classical root.* This name was adopted by Gray† for the Asiatic tapir, but was based on the same South American species as *Tapirus*.

Since no other generic name seems available for the Asiatic tapir I propose the following:

Acrocodia ‡ gen. nov.

Type.—*Tapirus indicus* Desmarest, from southeastern Asia, which will now stand as *Acrocodia indica* (Desmarest).

Diagnosis.—Similar in general to *Tapirus* and *Tapirella*, but with distinctive characters as follows: Braincase broad, elevated and inflated anteriorly, the antero-external surface of frontals facing outward, and not deeply channeled above the frontomaxillary suture as in *Tapirus* and *Tapirella;* lambdoid crest broadly U-shaped; maxillae not prolonged upward in thin vertical plates embracing and supporting mesethmoid as in *Tapirella*, the ascending branches nearly straight, with upper surface flattened, and above lachrymals becoming wedge-shaped and continued upward in same plane as frontals (ascending branches grooved or deeply channeled in *Tapirus*, the upper portions broadly overlapped on inner side by descending processes of nasals); nasals each with a deep circular

pit near middle of posterior border, and without the descending processes which in *Tapirus* meet and overlap the ascending branches of maxillae; maxillary floor of orbital fossa rising nearly to level of orbital border of jugal; posterior nares much elongated as viewed from below, and opening directly downward (shorter and directed downward and backward in *Tapirus* and *Tapirella*); maxillo-turbinals deeply plicated, the internal folds and alternating furrows of similar width (in *Tapirus* the furrows are separated by very narrow trenchant ridges; in *Tapirella* the maxillo-turbinals are smooth); transverse divisions of upper molars thick, the posterior walls less broadly excavated than in *Tapirus* and *Tapirella*; first upper premolar with a broad anterior cusp; third upper molar with outer cusps laterally compressed and connected by a high trenchant ridge, much as in *Tapirella*, instead of conical and separated by a deep notch as in *Tapirus*.

Remarks.—Among the most important and readily apparent cranial peculiarities distinguishing the three genera of existing tapirs are the differing arrangement of the bony parts supporting the proboscis. In *Acrocodia* and *Tapirella* the nasals are flat, triangular bones without the stout descending processes which in *Tapirus* meet and overlap the maxillae. In *Acrocodia* and *Tapirus* the maxillae are not developed upward in thin vertical plates embracing an anterior ossified extension of the mesethmoid as in *Tapirella*. Skulls of *Acrocodia* are thus distinguished by the absence of descending nasal processes and vertically ascending maxillary plates. In dentition the genera are much alike; *Acrocodia* in dental details seems nearer to *Tapirella* than to *Tapirus*.

The three genera represent the surviving branches of a family whose former range included much of Europe and North America. Tapirs apparently became extinct in Europe§ before the Pleistocene period, as none of their remains have been found in the caverns or alluvial deposits in which those of elephants, rhinoceroses, and hippopotamuses occur in abundance. The genus *Tapirella* is known only from the tropical parts of Middle America, from eastern Panama northward to southern Mexico. *Tapirus terrestris* ranges widely in tropical South America and the genus is represented in the high Andes by *T. roulinii* Fischer, a species with remarkably flattened braincase, but agreeing in essential generic characters with typical *Tapirus*. In northwestern Colombia and eastern Panama the distribution areas of *Tapirus* and *Tapirella* probably meet or overlap. *Acrocodia* is now restricted to southeastern Asia and islands of the East Indies, and its isolation therefore is measured by the full width of the Pacific Ocean.

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* Wagler (Nat. Syst. Amphibien, p. 17, 1830) quoting other authors says: "Nomina generica, quae ex graeca vel latina lingua radicum non habent, rejicienda sunt."

† Proc. Zool. Soc. Lond., p. 884, 1867.

‡ "Ακρος, high; κώδεια, head.

§ Flower and Lydekker, Mammals Living and Extinct, p. 372, 1891.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SUBSPECIES OF NUN BIRD FROM PANAMA.

BY E. W. NELSON.

Study of the birds collected during 1912 in eastern Panama by E. A. Goldman, while engaged on the Smithsonian Biological Survey of the Canal Zone, continues to reveal forms previously unknown. I am indebted to Mr. Robert Ridgway, Curator of Birds of the U. S. National Museum, for directing my attention to the present subspecies.

Monasa pallescens minor subsp. nov.
MARRAGANTI NUN BIRD.

Type No. 232,915, adult male, U. S. National Museum (Biological Survey Collection) from Marraganti, eastern Panama, collected April 5, 1912, by E. A. Goldman.

Distribution.—Known only from type locality.

Subspecific characters.—Differs from typical *pallescens* in its smaller size and darker, more plumbeous color.

Measurements of type.—Wing, 131.5 millimeters; tail, 119.5; culmen, 36.5; tarsus, 22.5.

Remarks.—This form has the bend of the wing and the upper and under wing-coverts much paler than the back, but a little darker and more plumbeous than in typical *pallescens*. The dark area of head and neck, as in the latter, merges gradually into the color of the body, and has a mixture of dark gray feathers scattered through the dusky, especially on top of head and neck. Goldman collected two of these birds during a brief stop at Marraganti in the lowlands, on his way out from Mount Pirri.

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A NEW LIZARD FROM PORTO RICO.

BY LEONHARD STEJNEGER.

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When finishing my "Herpetology of Porto Rico,"* in 1901, I had examined about 900 specimens from that little island, 540 of which were collected by Dr. Charles W. Richmond and myself during a two months' visit during which I paid special attention to the reptiles. There was consequently some reason for believing that the herpetological fauna might be exhausted, and that at least no conspicuous species would have escaped detection. It is true that Dr. Richmond and I discovered one on the very last day of our stay on the island, but that we regarded as positively the last novelty. Mr. Wetmore's discovery of a very distinct new species of lizard there consequently comes somewhat in the nature of a shock and illustrates once more the fortuitous character of reptile collecting. And yet, this very discovery might almost have been predicted on zoögeographical grounds. One of the distributional puzzles of the Antilles has been the occurrence of *Ameiva polops* on St. Croix, the southern island of the Virgin Island group, since its nearest, and in fact very close, relative, *Ameiva lineolata* was found in Hayti only. These two species form a somewhat isolated group among the other species of *Ameiva*, and it is therefore very gratifying to find a third species of this group represented on the island situated intermediate between the two other localities. I take great pleasure in naming it after its discoverer.

*Rep. U. S. Nat. Mus., (1902), 1901, pp. 549–724.

Ameiva wetmorei sp. nov.

Diagnosis.—Eight rows of ventral plates; caudal scales oblique, smooth; three occipitals; three supraoculars; fronto-parietals united.

Habitat.—Porto Rico.

Type-specimens.—Cat. No. 49,731, U. S. National Museum; Guanica, Porto Rico, above Rio Loco, May 20, 1912; Alex. Wetmore, collector.

Description of type specimen.—Nostril between the two nasals; anterior nasals broadly in contact behind rostral; fronto-nasal broader than long, in contact with nasals, loreal and prefrontals; prefrontals pentagonal, broadly in contact; frontal pentagonal, in contact with first and second supraoculars, not touching the third, a single, hexagonal fronto-parietal broadly in contact with third and very narrowly with second supraocular; three occipitals, the outer two very large, squarish, the median one long and narrow, almost rectangular; five superciliaries; three supraoculars, the first in contact with first superciliary, the others separated from the superciliaries by a single row of fine granules; last supraocular in contact with outer occipital; loreal undivided; seven supralabials, first in contact with posterior nasal only, second with posterior nasal and loreal, third largest, fifth and sixth in contact with a long subocular; temples with small, flat, irregular scales; mental followed by a large, unpaired postmental; six large infralabials, third largest; four pairs of chin-shields, first pair in contact, second pair half separated by granules of chin; between infralabials and chin-shields posteriorly a single line of flat scales, the two posterior ones large, the anterior small, not reaching first pair of chin-shields; chin and throat covered with small scales or granules diminishing in size posteriorly; mesopthychium with a median patch of enlarged scales, the larger ones about four times the size of the chin granules; back, sides, and upper surface of limbs covered with granules which are slightly enlarged into small hexagonal scales on the median line of the back; underside of body with eight longitudinal and thirty-five transverse rows of rectangular plates, the outer row less than one-half the size of the next one; one large preanal plate, preceded by one much smaller, and this one by two still smaller placed transversely; on the lower arm two rows of large antebrachials, separated from the much smaller single row of brachials by small scales, on the lower edge of the upper arm a single series of enlarged plates; underside of thigh covered with two series of large scales or plates and three smaller ones; thirteen or fourteen femoral pores; underside of tibia covered entirely across by three plates, of which the upper is the largest and larger than the other two together; upper side of wrist with three series of enlarged plates; fifth (outer) toe extending far beyond the first (inner) almost to the claw of the second; tail covered with smooth scales in rings, the scales being oblique with parallel sides, except the median row, which is wedge-shaped; about twenty-two scales in the fifteenth ring from the base. Coloration (in alcohol) above dark brownish olive with seven distinct greenish white longitudinal lines, the median one somewhat wider than the others and starting from the tip of the snout while the others originate in front of the eye, and continuing some distance

on the tail except the outer row, which terminates in the groin; upper side of limbs also dark olive brown with very distinct round greenish-white spots; underside greenish white darkening on tail. Mr. Wetmore describes the tail of the living animal as varying from brilliant emerald green to grayish blue according to the light, and the underside as dull clay red.

Dimensions.

	mm.
Total length	148
Snout to vent	47
Tail	101
Snout to ear	11
Width of head	7
Fore leg from axilla	14
Hind leg from groin	29
Outer toe without claw	5.5
Inner toe without claw	3

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OF THE

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A NEW PTEROPINE BAT FROM LUZON.

BY GERRIT S. MILLER, JR.

[By permission of the Secretary of the Smithsonian Institution.]

Among some bats collected by Dr. Paul Bartsch in a cave at Montalban, Luzon, Philippine Islands, on July 5, 1908, is an adult male of a species of *Eonycteris*, a genus not hitherto recorded from the archipelago.* The animal is quite distinct from *Eonycteris spelæa* as represented in the National Museum by specimens from the Malay Peninsula, and from the Bornean *E. major* as described by Andersen. It may be known as:

Eonycteris robusta sp. nov.

Type.—Adult male (in alcohol), No. 175849, U. S. National Museum.

Diagnosis.—Size above the maximum for males of *Eonycteris spelæa*, but somewhat less than in the female (male not known) of *E. major;* color as in *E. spelæa*; skull as in the related species, but with conspicuously deepened mandibular ramus (depth at posterior margin of m_3 4.2 instead of 3.2); teeth differing from those of both *E. spelæa* and *E. major* in the reduced, distinctly narrowed condition of crowns, a character especially noticeable in m^1, pm_4, and m_1.

Measurements.—Head and body, 125; tail, 22; tibia, 38.6 (32, 33);† foot, 20 (20, 19.5); forearm, 78 (73, 79.5); thumb, 25.4 (24, 24); second digit, metacarpal, 33 (33, 33.5); third digit, metacarpal, 52 (48.5, 54); first phalanx, 35 (33, 34.5); second phalanx, 46 (43, 45); fourth digit, metacarpal, 52 (47, 47.5); first phalanx, 27 (27.5, 28.5); second phalanx, 30 (25.5, —); fifth digit, metacarpal, 49 (43.5, 51.5); first phalanx, 24 (21.5, 23.5); second phalanx, 22.6 (19.5, 24); ear, 19 (19, —); width of ear, 14 (13, —); condylobasal length of skull, 35.2 (35.5, 36.8); breadth of braincase, 14.9 (15.2, 16.2); zygomatic breadth, 22.2 (22.8, —); rostral

* See Hollister's list of mammals of the Philippine Islands (Philippine Journ. Sci., vol. 7, sect. D, No. 1. February, 1912) and Andersen's Catalogue of the Chiroptera in the British Museum, 2nd ed., vol. 1, p. 732. March 23, 1912.

† Of the measurements in parenthesis the first is the maximum of 8 males of *E. spelæa*, the second that of the type (female) of *E. major*, both as recorded by Andersen.

breadth over roots of canines, 7.8 (7.8, —); postorbital constriction, 7.8 (8.5, 9.0); interorbital constriction, 7.6 (7.8, 8.0); mandible, 27.9 (28, 30.5); coronoid height, 11.2 (10.7, —); maxillary toothrow, 13.5 (13.0, 13.8); mandibular toothrow, 14.8 (14.6, 15.4); m^1, 2.2 x 1.0 (2.6 x 1.4, 2.3 x 1.2); pm_4, 1.8 x 0.7 (2.0 x 1.2, 2.0 x 0.9); m_1, 1.9 x 0.8 (2.4 x 1.3, 2.1 x 1.1); m_3, 0.9 x 0.6 (1.2 x 0.9, 1.2 x 1.0).

Remarks.—The Philippine *Eonycteris* is readily distinguishable from *E. spelæa* by its greater general bulk, longer forearm and tibia, deeper mandibular ramus, and smaller teeth. Its relationships with the imperfectly known *E. major* are not so clear, but the general size appears to be less (forearm of male *robusta* about equal to that of female *major*), the color shows none of the peculiarities described in the Bornean species, and the size of the individual teeth is noticeably reduced.

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PROCEEDINGS

OF THE

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THE SCALES OF THE SIMENCHELYID, OPHIDIID, BROTULID AND BREGMACEROTID FISHES.

BY T. D. A. COCKERELL.

I am greatly indebted to Mr. C. Tate Regan, of the British Museum, for scales of four families of fishes which I had not previously been able to study. The specimens prove not merely interesting, as representing undescribed forms, but quite remarkable for the light they seem to throw on the structure and relationship of other scales.

Simenchelyidæ.

Simenchelys parasiticus. North Atlantic. The minute scales are about 720μ long and 225 broad, thus greatly elongated, and rounded at the ends. The scale consists of concentric rows of minute oblong elements, which, when the scales are broken, rather readily come apart. These structures are identical in general character with the separate elements described and figured by H. W. Marett Tims (Quart. Journ. Micr. Sci., 49, Oct., 1905, pl. 6) as occurring in *Gadus*. Essentially the same thing is found in *Synaphobranchus pinnatus*. The structural resemblance between the scales of the eels and those of the Brotulidæ, Gadidæ, etc., is astonishing.

Ophidiidæ.

Genypterus blacodes. Tasmania. Scales about 2 mm. long and 1⅓ broad, usually distinctly subtriangular, with the corners obtuse. The numerous radii extend in every direction from the nucleus, and the whole scale is divided into small transversely elongate plates, precisely in the manner of *Gadus*. The plates are very minutely beaded or nodulose on the outer (laterad) side, a fact first noted by Dr. Max Ellis, who examined the scales with me. Some of the radii are incomplete, as may be seen in *Gadus* (Tims, l. c., pl. 6, f. 6). Except for the subtriangular shape and the minute nodulosity of the outer sides of the plates, I do not know how the scale of *Genypterus* can be separated from that of *Gadus*.

Brotulidæ.

Brotula maculata. Madras. Scales about 4⅔ mm. long and 2 broad, thus greatly elongated, with broadly rounded ends, approaching somewhat in shape the scales of the eels. The sides are subparallel, and the nucleus is far (a variable distance) toward the base. The extremely numerous radii extend in all directions from the nucleus, and the whole scale is divided into small transverse blocks or plates, exactly as in *Gadus*. The sculpture is very regular, fine and beautiful. Some of the plates, especially the outer lateral ones, have the outer margin very minutely granular or microscopically crenulate, an approach to the condition found in *Genypterus*. The scales can not be said to differ in any important character from those of the Gadidæ, or from those of *Genypterus*. *Brosme* in the Gadidæ has long and narrow scales.

Neobythites steaticus. Persian Gulf. Scales oblong with rounded ends, about 3¼ mm. long and 2 wide, the nucleus near the base; the radii extending in every direction, but not nearly so close as in *Brotula maculata*. The general form and structure of the scale is as in *Gadus callarias* or *Brotula*, but there is an important difference in the plates of the central part of the scale apicad of the nucleus, which are squarish, and in the middle line become much longer than broad, while their surface is ornamented with irregular and minute but very strong and distinct reticulations. The elongated basal and lateral plates are without this reticulation. One scale has the nuclear area broadly ornamented with fine striæ in irregular bundle-like groups, gradually passing apicad into the reticulation already mentioned. Dr. Max Ellis calls my attention to the extraordinary resemblance between these structures and those of certain Gymnotidæ. Thus a scale of *Sternarchus brasiliensis* shows the reticulation of the plates; while *Gymnotus carapo* and *Adontosternarchus sachsi* show the bundle-like striæ to perfection. The whole structure of the Gymnotid scale is also extremely suggestive of the Brotulid-Gadid type.

Regan (Ann. Mag. Nat. Hist., Sept., 1912, pp. 277–279) places the Brotulidæ, Ophidiidæ and Fierasferidæ together in a division Ophidiiformes. The Fierasferidæ are without scales.

Bregmacerotidæ.

Bregmaceros atripinnis. Bombay. This genus is placed by Boulenger and Goodrich in the Gadidæ, but the scales are very peculiar. They are about 1½ mm. long, 1 mm. or a little more in width, very broadly rounded apically, parallel-sided, and with the very broad base truncate, the truncation usually with a distinct but low median angular projection. The nucleus is a little basad of the middle, varying to practically central. *The coarse circuli of the basal field are wholly longitudinal*, curving over to meet above the nucleus, so that all the circuli of the region apical of the nucleus are concentric as usual. Just above the nucleus the meeting circuli form a regular broad arch, but beyond this most of them, in the majority of scales, form a conspicuous angle at the point of junction.

Sometimes the angulation of the circuli is to one side of the middle line. Between the circuli are very numerous squarish to suboval plates, corresponding to the plate-like elements described in the *Gadidæ*, etc., but square or higher than wide, never transversely widened. In the basal region, where the circuli are longitudinal, *the plates fuse together to form longitudinal ridges.* In this region the intervals or sutures between the rows of fused plates, *the true circuli, are finely and regularly beaded.*

This remarkable scale may perhaps be the key to the understanding of scale structure, and if so, it must be held to confirm the Timsian theory of the development of scales from placoid-like elements. It is at any rate impossible to doubt that the basal longitudinal ridges between the circuli are formed by the fusion of the small squarish bodies which are seen just above, and gradually pass into the ridges. We also seem to see the manner of origin of the beaded circuli of the Osteoglossidæ, etc. On this view, it is easy to understand why the fine longitudinal basal fibrillæ of *Albula* present a minutely segmented appearance. Such a view will, however, force us to conclude that the *Amia calva* scale is not primitive in structure, the fine solid longitudinal fibrillæ representing the perfection of the tendency which we observe in *Bregmaceros*. The relative positions of these fishes in the Ichthyological system is certainly against this view, but it is possible that *Amia* has specialized scales.

Whatever *Bregmaceros* may or may not prove in relation to scales in general, it is certainly significant in relation to the two quite distinct groups of Gadoid scales indicated in Proc. Biol. Soc. Wash., xxiv, p. 212. *Urophycis* and *Enchelyopus* show beaded circuli; in *Urophycis regius* the basal circuli are practically longitudinal, though converging toward the middle, while followed round to the middle of the apical field, they meet at an acute angle. The *Merluccius* scale, apicad of the nucleus, shows a fine reticulation between the circuli, exactly corresponding with that in *Neohythites*.

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PROCEEDINGS

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BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

ELLIMMA, A GENUS OF FOSSIL HERRINGS.

Professor Theodore D. A. Cockerell calls my attention to the fact that the name *Ellipes*, given by me (Annals Carnegie Museum VII, No. 1, 1912, page 23) to a genus of fossil Clupeoid fishes from the Eocene Shales of Riacho Doce, Brazil, was preoccupied by Scudder (Psyche, IX, p. 308, 1902) for a genus of crickets. The genus of extinct herrings may then be renamed **Ellimma,** the type being *Ellipes branneri* Jordan.

—*David Starr Jordan.*

THE TYPE SPECIES OF *CUNICULUS* BRISSON.

The type species of the genera of mammals dating from Brisson, Regnum Animale, 1762, were fixed by Dr. C. Hart Merriam in 1895 (Science, N. S., I, p. 375). With the exception of *Cuniculus* all were fixed by tautonymy or monotypy. Working with the original A. O. U. code, Doctor Merriam fixed the type of *Cuniculus* by elimination as *Cuniculus cauda longissima* Brisson = *Dipus alactaga* Olivier = *Cuniculus alactaga* (Olivier), 1800. According to Article 30 of the International Code this disposition of *Cuniculus* is not permissible, because *C. cauda longissima* was placed in brackets at the end of the series; and the introduction to the work explains that species so placed were doubtfully referred to the genus. Aside from *Allactaga*, which is thus clearly not to be replaced by *Cuniculus*, Brisson's genus contains representatives of the five modern genera *Dasyprocta*, *Agouti*, *Lemmus*, *Citellus* and *Cavia*, all of later date. As the type can not be fixed from this assemblage by any other rule, it must be selected. To avoid as much confusion as possible I propose that it be fixed on *Paca*, Brisson, p. 99, based on *Cuniculus major palustris, fasciis albis notatus* Barrere, 1741. *Cuniculus* Brisson, 1762, thus antedates and replaces *Agouti* Lacépède 1799, and the forms included in this genus become—

Cuniculus paca nelsoni (Goldman).
Cuniculus paca paca (Linnæus).
Cuniculus paca virgatus (Bangs).
Cuniculus sierræ (Thomas).
Cuniculus sublævis (Gervais).
Cuniculus taczanowskii (Stolzmann).

—*N. Hollister.*

A NEW NAME FOR *OCHOTONA MINIMA*.

Lagomys minimus Lord (Proc. Zool. Soc. Lond., p. 98, 1863) is preoccupied by *Lagomys minimus* Schinz (Das Thierreich, I, p. 320, 1821). Therefore, a new name is required for the pika of southern British Columbia described by Lord and now generally recognized as a valid species without synonyms. I propose for it **Ochotona fenisex.**

—*Wilfred H. Osgood.*

SOME OVERLOOKED NAMES OF SICILIAN MAMMALS.

In 1868 a catalog of the mammals of Sicily was published by Minà Palumbo.* This paper contains the description of the well-known *Pitymys nebrodensis* (Minà Palumbo); but the fact that other names appear here for the first time has been generally overlooked. A recent paper by Count Filippo Cavazza† on the identity of the *Vespertilio noctula* var. *sicula* of Minà Palumbo having called attention to the subject the paper seems to merit a special note, particularly as all but one of the new names have escaped citation in the recent general works of Trouessart and of Miller on the Mammals of Europe. The overlooked names are as follows:

V [*espertilio*] *noctula* var. *sicula*, page 13. Type locality, Le Madonie, Sicily.

Although the name *sicula* has been substituted by Cavazza for *maximus* Fatio as the earliest designation of the large European *Nyctalus* there can be no doubt that it refers to *Eptesicus serotinus*. This is clearly shown by the statement that the two terminal vertebræ of the tail are free, and by the lengths of the third and fifth fingers, 95 and 70 mm. respectively. In six specimens of *Eptesicus serotinus* whose external measurements I have recorded‡ these fingers vary from 84 to 92 mm. and from 63 to 68 mm., while in eight specimens of *Nyctalus noctula* the extremes are 94 to 102 and 56 to 62, indicating a wing of quite different form. In three *N. maximus* the third finger ranges from 114 to 123, the fifth from 72 to 77. The name *sicula* must therefore be placed in the synonymy of *Eptesicus serotinus serotinus* unless a Mediterranean race of the species is to be recognized.

Vespertilio nebrodensis, page 24. Type locality, Le Madonie, Sicily.

The description of the tragus and of the color indicate that this animal is an individual of *Pipistrellus savii* in the phase in which the light wash on dorsal surface is obsolete.

[*Mustela vulgaris*] a. *fulva*, page 53. Type locality, wooded regions [probably of Le Madonie].

*Catalogo dei Mammiferi della Sicilia. Ann. Agr. Sic., 2nd ser., vol. 12, separate paged 1–123, and dated Palermo, 1868 (original publication not seen).

†Boll. Soc. Zool. Ital., Roma, 2d ser., vol. 12, pp. 251–260. December 18, 1911.

‡Cat. Mamm. Western Europe, p. 230, November 23, 1912.

[*Mustela vulgaris*] b. *albipes*, page 54. Type locality, cultivated regions [probably of Le Madonie].

These two names, based on local variations in *Mustela nivalis boccamela*, have thirty-two years priority over *Putorius nivalis siculus* Barrett-Hamilton should the Sicilian form eventually be recognized as distinct.

[*Mus musculus*] var. *melanogaster*, page 70. Type locality, Sicily.

[*Mus musculus*] var. *albinus*, page 70. Type locality, Sicily.

[*Mus musculus*] var. *rubicunda*, page 70. Type locality, low country of Le Madonie, Sicily.

Three synonyms of *Mus musculus azoricus* (Schinz), 1845.

[*Mus sylvaticus*] var. *griseus*, page 72. Type locality, Sicily.

[*Mus sylvaticus*] var. *isabellinus*, page 72. Type locality, Sicily.

Two synonyms of *Apodemus sylvaticus dichrurus* (Rafinesque), 1814. The first antedates *Mus arianus griseus* True, 1894,* which may be replaced by **Apodemus flavicollis rusiges.**

—*Gerrit S. Miller, Jr.*

* Proc. U. S. Nat. Mus., XVII, p. 8, May 8, 1894. Type locality, central Kashmir. The animal is a member of the *Apodemus flavicollis* group. Though its status is not definitely understood a name seems desirable.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE KING RAIL OF CUBA.

BY J. H. RILEY.

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Ever since I was in Cuba with Mr. William Palmer in 1900, and became aware that a form of King Rail was resident on the island, though we failed to obtain a specimen, I have been extremely desirous of examining a series of breeding birds from that island. In 1911, when Mr. Charles T. Ramsden began to correspond with the Division of Birds, I asked him if it would be possible to secure a few breeding King Rail from Cuba for the U. S. National Museum and he promptly replied that he only had one specimen in skin form which he generously presented to the Museum. While this specimen differed in certain particulars from the King Rail, I hesitated to name it on the strength of a single specimen. While in Washington in the fall of the past year, Mr. Ramsden said he had a small series of mounted birds which he would take down and loan me for comparison. This he has done at considerable trouble, forwarding his entire series, consisting of five birds, all from the type locality. In consideration of the great interest he has shown in the matter and for his intimate knowledge of the ornithology of Cuba, it is no more than just that this form of rail should bear his name and I take great pleasure in naming it in his honor. It may be known as:

Rallus elegans ramsdeni subsp. nov.

Type, U. S. National Museum, No. 233,478, adult male, Guantanamo, Cuba, May 4, 1910. Collected by Charles T. Ramsden.

Characters.—Similar to *Rallus elegans elegans*, but smaller, paler, and sides of head behind eye grayer.

Description.—Top of head vandyke brown, the forehead with the bristly shafts darker and the occiput with obscure darker mottlings; hind neck, back and scapulars wood brown with broad dark seal brown centers to the feathers, the hind neck more tawny and the dark centers rather obscure; rump and upper tail-coverts darker than the back (nearer broccoli brown) and the dark centers to the feathers not so pronounced; a supra-loral streak extending to just above the eye, a spot below the eye, and throat, white; supra-auricular region, light neutral gray; lores and a line below and extending beyond eye, vandyke brown, bordered below by vinaceous-cinnamon; sides of neck and breast, vinaceous-cinnamon; abdomen, white; lower tail-coverts blackish brown barred with and bordered on each side with white; sides blackish brown barred with white; thighs, drab externally, white internally; bend of wing bordered with white; wing-coverts hazel; primaries and secondaries blackish brown, becoming lighter towards the tips and slightly margined externally with reddish, this color becoming more pronounced on the inner primaries and secondaries; under wing-coverts blackish, barred with white and a little vinaceous-cinnamon, the latter color more pronounced along the border; tail broccoli brown with a broad central stripe of seal brown. "Iris lightish brown." Wing, 149; tail, 53; culmen, 57; tarsus, 54.5; middle toe, 50 mm.

Remarks.—This form in color is not very different from *Rallus e. elegans*, but is quite a little smaller in all its measurements as the following will show:

	Wing.	Tail.	Culmen.	Tarsus.	Middle toe.
2 adult males from Cuba . . .	152.8	56.5	57.5	55.8	49.8
8 adult males from eastern U.S.	167.1	68.6	63	59.9	54.2
3 adult females from Cuba . .	144.2	58.5	52.5	51.3	42.3
4 adult females from eastern U.S.	156.4	63.9	57.6	54.9	50.9

Besides the five adults listed above from Cuba there is an immature male that when compared with young of *R. e. elegans* in the same state of plumage appears to be slightly darker. One of the females (No. 386, Coll. Charles T. Ramsden) is unique in that it lacks the hazel of the wing coverts which are Brussels brown barred with black and white and the vandyke brown stripe below and beyond eye is lacking or barely indicated. These appear to be characters of the immature, though the bird appears to be in adult plumage, otherwise. Some of the specimens of *Rallus e. elegans* show the white spotting or barring on the wing-coverts to a greater or less extent but not in such a pronounced manner as the above specimen.

Though Gundlach* gives the King Rail as a resident breeding bird in

* Orn. Cubana, 1895, 239.

Cuba, his statements appear to have been generally overlooked. The following remarks of Mr. Ramsden are pertinent and I hope will remove all doubts upon the subject: "Specimen No. 7, I got as she was hatching; a mule stepped on and injured her. I picked her up with the eggs and brought her home, but the next morning she was dead, so there is no doubt that she is a breeding bird. No. 203 is also a breeding bird. To my mind they are all good Cuban examples and I hope will fit your purpose." Without direct proof it is extremely doubtful if *Rallus e. elegans* occurs in Cuba at all.

Vol. XXVI, pp. 87–88 May 3, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A *PERIPATUS* FROM GUATEMALA.

BY T. D. A. COCKERELL.

No *Peripatus* has hitherto been known from Guatemala, but Mr. E. Bethel, the well-known naturalist of Denver, when recently at Puerto Barrios, found a specimen which he has kindly placed in my hands for description. It will later be transmitted to the U. S. National Museum.

Peripatus (Epiperipatus) biolleyi Bouvier, var. **betheli** v. nov.

Female.—Length 34 mm., rather slender, width in middle about 4½ mm.; thirty pairs of legs; above uniform dark wood brown, without markings; antennæ blackish; ventral surface pallid, with a brownish-lilac tint; body densely tuberculate, the transverse folds fairly distinct, but in places obscured by the irregularity of the tubercles or papillæ; laterally, however, the folds are as well defined as dorsally; no median dorsal line; many of the papillæ are elongate and conical; accessory papillæ few, but primary ones very diverse in size; foot-pads and nephridial tubercles essentially as in *biolleyi;* nephridial tubercle between the third and fourth pads, independent, the fourth pad well developed, not divided; all the pads large and broad, as in *biolleyi;* outer blade of mandibles as in *biolleyi;* inner blade nearly as in *biolleyi;* the peculiar second (accessory) denticle shaped as in *biolleyi*, and the third (rudimentary) one also as figured by Bouvier, except that the angular point is more pronounced; the row of small teeth beyond consists of 9, instead of 10 or 11 as in *biolleyi*.

Peripatus biolleyi was described from near San José, Costa Rica, on the divide between the Atlantic and Pacific slopes, at an altitude of 1,161 meters. Other specimens were found on the Pacific slope at an altitude of 250 meters. The species has not been found outside of Costa Rica, but a specimen of *Peripatus* having 30 pairs of legs was found in British Honduras, and is briefly noted by Brues in Bull. Mus. Comp. Zool., LIV (1911), p. 317. This latter was so poorly preserved that it could not be determined, but I suppose that in all probability it belongs to *betheli*.

Considering the locality of Mr. Bethel's *Peripatus*, at sea level on the Atlantic side of Guatemala, 500 miles from the locality of *P. biolleyi*, we should expect it to be a distinct species. It differs from *biolleyi* strikingly in color, and slightly in the teeth. It also certainly seems to have the papillæ more irregularly placed, quite, in fact, as in the otherwise diverse *P. isthmicola*. This character is not so satisfactory as one could wish, owing to a certain lack of uniformity in the papillæ of different parts of the body.

On the other hand, the peculiar accessory denticles of the inner blade of the mandibles are of the *biolleyi* type, and no other *Peripatus* has anything very like this. The same may be said of the arrangement of footpads and nephridial tubercles. Bouvier notes that the original *P. biolleyi*, from near San José, was yellowish red (jaune roux), whereas the specimens from a lower altitude on the Pacific slope were marked like *P. trinitatis*, with a series of dorsal losenges. Is it not probable that there are two races in Costa Rica, one belonging to the highlands, the other to the low country on the Pacific side? Mr. Bethel's animal presumably represents a special race or subspecies of the tropical Atlantic coast-region, which may extend southward as far as Costa Rica.

Mr. Bethel's specimen was in process of moulting, and the new skin exposed was consequently very fresh and well colored, so that there is no doubt concerning the natural colors of the animal.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE SCALES OF THE BLENNIOID FISHES.

BY T. D. A. COCKERELL.

In the *Annals and Magazine of Natural History*, September, 1912, Mr. C. Tate Regan has a valuable revision of the classification of the Blennioid fishes, which are included in a suborder Blennoidea, with three divisions known as Blenniiformes, Cliniformes, and Ophidiiformes. Having found the scales of the Ophidiiformes extremely interesting, I was anxious to add to my very scanty knowledge of the lepidology of the other groups. Mr. Regan has kindly sent me from the British Museum the scales of three species, representing two families of Cliniformes. Two other Cliniform genera are represented in material from the Woods Hole collection, one of them adding another family. The Blenniiformes include four families, of which I have one, the Anarrhichadidæ. The Blenniidæ have no scales.

BLENNIIFORMES.

Anarrhichadidæ.

Anarrhichas lupus. Woods Hole. The minute circular scales have a practically central nucleus, from which radii extend in every direction except apically, cutting the well-defined and coarse circular fibrillæ.

CLINIFORMES.

Clinidæ.

Clinus (Labrisomus) nuchipinnis. Caribbean Sea (British Museum). Scales oblong, relatively large, being about 3⅓ mm. long and 2⅔ broad. Nucleus less than a third of total length from apex; about 20 strong basal radii, others rudimentary; no lateral radii; basal margin shallowly crenulate; circuli strong, those in the basal field very minutely but distinctly denticulate on the inner (apicad) side; in the lateral field, where the circuli run longitudinally and are not cut by radii, the minute beading

or denticulation can only be seen with a high power of the microscope; apical field, from a little apicad of the nucleus, thin, granular, without any circuli or radii.

Lepidoblennius haplodactylus. New South Wales (Brit. Mus.). Scales very small, the largest little over half a mm. diameter; broader than long, with the same apical field without radii or circuli as in *Clinus*; radii 9 to 12, basal, broadly cutting the very widely spaced circuli. This is simply a very degenerate scale of the *Clinus* type, looking entirely different because of its shape and few, widely spaced circuli, which are only about nine in number. The ciculi are without beading.

Stichaeidæ.

Dictyosoma temminckii. Japan (Brit. Mus.). Scales excessively minute, elongate-oval, about 800 microns long and hardly half as wide, the ends broadly rounded; circuli coarse, extending all around the scale; no distinct radii, but one or two irregular and imperfect ones in the basal region. The circuli show exceedingly minute and imperfectly developed beading.

Ulvaria subbifurcata. Scales of the same general type as those of *Dictyosoma*, but less degenerate, having several well defined basal radii and an apical thin field without radii or circuli.

Pholididæ.

Pholis gunnellus. Scales minute, more or less circular to oval; radii lateral as well as basal. Scales of the same general character as those of *Anarrhichas.*

All the above are really degenerate scales except those of *Clinus*, which should indicate better than any of the others the affinities of the suborder. The description of the scales of *Clinus* given above will nearly apply to those of *Helicolenus dactylopterus* in the Scorpaenidæ. In *Helicolenus* the radii are not so close together, and the apical field is ornamented with spots, representing broken up fragments of circuli, but the essential characters are practically as in *Clinus.* Other Scorpaenids are ctenoid, affording an excellent transition to the typical ctenoid scale of the Percoid fishes. Mr. Regan writes (in litt.): "That the Blennioids are modified Percoids seems almost indisputable;" and the scale characters of the Blenniiformes and especially Cliniformes support this view. Goodrich places the Scorpaeniformes next to the Blennioids, and while they may not occupy a strictly intermediate position between the Blennioids and the Percoids, they at least have the intermediate type of scales. It must also be said that there is nothing in the scales of the series described above to suggest that they are not related. In spite of superficial differences they conform to a single general type.

When we come to Regan's division 3, the Ophidiiformes, the case is very different. The scales are entirely of the Gadoid type. The very numerous radii extend all around the scale, and there is no apical area without circuli or radii. There is nothing whatever to indicate any

former ctenoid features. There is indeed a certain resemblance in structure between the scales of *Genypterus* and *Anarrhichas*, but it is probably not fundamental. Considering the scale-structure, together with the osteological characters mentioned by Regan, it seems that the Ophidiiformes should stand against the other two divisions combined. Thus the Blennioidea will include the Blenniiformes and Cliniformes, while the Ophidiiformes will go in a distinct suborder or superfamily Brotuloidea.

Mr. Regan expresses the opinion (in litt.) that "the Gadoids seem to have sprung from some more primitive group [than the Percoids], such as generalized Iniomi (Aulopidæ) or Berycoids (near Polymixiidæ)." It is recognized that the Brotuloidea are quite distinct from the Gadoids, but may they not represent still another independent branch, arising from fishes more specialized than the immediate ancestors of the Gadoids, yet without the ctenoid scales of the typical Percoids? It should be added that the scales of *Polymixia* are ctenoid, and are as different from those of the Gadoids as possible. I do not know the scales of Aulopidæ, but those of the Synodontidæ (*Trachinocephalus* and *Synodus*) show no Gadoid features.

Postscript.—Since the above was written I have received through the kindness of Dr. Edwin C. Starks scales of *Dactylagnus mundus* (Carmen I., Gulf of California; Albatross collections), a representative of the Dactyloscopidæ. This family is placed by Regan in the Cliniformes, but has been referred by other authors to quite different groups. The scales are about 2 mm. long and 2½ broad; nucleus considerably basad of the middle; radii basal, very numerous (over 40), extending to the sides of the base, only the middle ones reaching the nuclear area; basal margin not or hardly crenulated; basal circuli very numerous but irregular, cut by the radii; nuclear area, and the region basad of its level, finely ornamented with a pattern curiously simulating a finger-mark, composed of variously broken and anastomosing circuli; in the nuclear field producing irregular reticulations, but apically largely resolved into dots, the trend of the circuli mainly longitudinal, but spreading laterally, pointing at an angle of about 45° to the margin; apical margin of scale very thin, easily frayed or broken, finely granular. The lateral line canals are forked basally, forming a Y with very short arms and a long stem. By the position of the nucleus, this is very different from *Labrisomus*, but the general structural features are not dissimilar, and so far as it goes, the scale of *Dactylagnus* confirms the position of the fish in the Blennioidea. The Dactyloscopidæ have been placed near the Uranoscopidæ by Gill. Dr. Starks sends scales of *Uranoscopus scaber* which he collected at Naples, Italy. The very small (1–1⅓ mm. long) scales are covered by skin and scarcely at all imbricated. They are elongated, with the shape of an oyster shell, the apex obtusely pointed, the base broadly rounded. The nucleus is very near the apex, and from its vicinity run about ten long, partly broken, basal radii. The circuli are coarse and dense, not only interrupted by the radii, but considerably broken up in the apical field. This scale is entirely diverse from that of *Dactylagnus*, and does not suggest that of any Blennioid.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE GREEN HERON OF THE MALDIVES.

BY OUTRAM BANGS.

Dr. Henry B. Bigelow, while with Mr. Agassiz on his expedition to the Maldives in 1901–1902, collected for the Museum a number of birds, among them one adult female Green Heron. This differs so much from any known species of *Butorides* that at first I hesitated to describe it, fearing it might be a "freak."

The species, however, is known to be resident and to breed in the Maldives and is said by Gadow and Gardiner,* who refer it to *Butorides javanicus*, to occur in all the islands. Judging from the text, I infer that no specimens were secured by Gardiner, as no mention is made of any skin having been brought home.

On account of its very pallid coloring, the Green Heron of the Maldives may be known as—

Butorides albidulus sp. nov.

Type from Suvadiva Atoll, southern Maldives, adult ♀, No. 39356, M. C. Z. Collected January 2, 1902, by Dr. Henry B. Bigelow.

Characters.—Size of *B. javanicus* (Horsf.); bill slightly heavier; colors all extremely pale, the crown with its occipital plumes, alone of the upper parts, dark metallic green; rump, upper tail coverts and tail grey, each rectrix deeply bordered all round with white; lower surface very pale grey; under tail coverts and lengthened neck plume, white; wing feathers very broadly edged with white, becoming pale buffy on lesser and middle coverts.

Color.—Crown and lengthened occipital plumes dark green; an ill-defined superciliary stripe, throat and fore neck, including lengthened plumes, that fall over chest, white, in places slightly washed but not regularly marked with buffy; sides of neck and body below pale silvery grey; cheeks grey washed with buffy; middle of belly and under tail

* Gardiner, Maldive and Laccadive Archipelagoes; Aves, p. 369, 1903.

coverts dull greyish white; dorsal plumes pale grey, the longer lateral ones slightly greenish toward tips and edged basally with buffy; lower back, rump, upper tail coverts and tail dull grey; each rectrix bordered all round with white, the outer ones mostly white; remiges dull slate grey, each feather narrowly edged with white and white-tipped, except the four longest—outer most—primaries, on which the white tips are nearly obsolete; all the other wing feathers very deeply margined with whitish, becoming pale buffy on some of the middle and most of the lesser coverts.

Measurements.—Type, adult female, wing, 165 mm.; tail (feathers), 57 mm.; exposed culmen, 63 mm.; tarsus, 46 mm.

Remarks.—So far as general paleness of coloration is concerned the Green Heron of the Maldives is, without doubt, most nearly matched by *Butorides crawfordi* Nicoll of Assumption Island, and both species present the striking character of the tail feathers, all being deeply bordered with white. The latter species was probably, however, derived from *Butorides atricapillus* (Afzel.), whereas *Butorides albidulus* of the Maldives had its origin in *Butorides javanicus* (Horsf.), and the general likeness of the two species is probably due to their both living under similar conditions upon coral islands, and not to near relationship.

The new bird differs from *B. crawfordi** chiefly as follows: Crown green (not blue); underparts mostly pale grey, not (wholly "milky white"); no series of dusky spots along front neck; *tail* and *upper tail coverts* as well as rump grey (not green); wings with much wider pale borders to the feathers, these borders white on primaries and secondaries, buff on most of the smaller feathers.

*I of course have seen no skins of *B. crawfordi* and base what I say upon the description, Bull. B. O. C. Vol. XVI, p. 105, 1906, and the plate, *Ibis*, 1906.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW WARBLER FROM WESTERN CHINA.

BY OUTRAM BANGS.

When Thayer and I reported upon the birds collected by W. R. Zappey in China (Memoir of the Museum of Comparative Zoology, Vol. XL, No. 4, August, 1912), we had no specimens from elsewhere of *Reguloides pulcher* (Blyth) with which to compare the three examples taken during the breeding season at high elevations in western Szechwan, and therefore referred them to that bird without comment. Western China was a wholly new region for the species and I was not surprised when later I discovered two skins from Sikkim in the Museum of Comparative Zoology to find them very different from the Chinese bird, which may be known as—

Reguloides pulcher vegetus subsp. nov.

Type, No. 52503 M. C. Z., adult ♀, western Szechwan, Yachiakun. Collected July 14, 1908, by W. R. Zappey at 12,500 feet altitude.

Characters.—Much paler and duller in color throughout than is true *R. pulcher* (Blyth) of the Himalayas. Upper parts much duller olive-green; superciliary stripe much paler—about straw yellow; rump patch primrose yellow, instead of olive-yellow; underparts much paler, being dull greyish straw-yellow instead of greenish maize yellow.

Measurements.

No.	Sex.	Locality.	Date.	Wing.	Tail.	Tarsus.	Exposed culmen.
52504	♂ad	W. Szechwan, Washan	June 4	58.5	41.	20.	9.5
52505	♂ad	" Tachiao	July 15	60.	42.	20.	9.5
52503	♀ad	" Yachiakun	July 14	54.5	38.5	18.	9.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NATURAL HISTORY NOTES ON SOME BEAUFORT, N. C., FISHES,—1912.

BY E. W. GUDGER.

State Normal College, Greensboro, N. C.

The following notes are in part based on fishes collected during a brief visit to the Beaufort Laboratory of the United States Bureau of Fisheries in the closing days of May, 1912; in part on collections made by Mr. Russell J. Coles of Danville, Va., at Cape Lookout during July and August of the same year, the notes concerning which he has been so kind as to put in my hands; and in part from miscellaneous sources.*

These Notes for 1912 are published in continuation of similar ones made in 1909 and in 1910–11 (Gudger 1910, 1912, 1912a, 1912b,), and it is hoped may not be devoid of value to students of ichthyology.

Elasmobranchii.

Carcharhinus lamia (Rafinesque). (?)

CUB SHARK; REQUIN; LAMIA.

On July 9 Coles captured in the bight of Cape Lookout a female shark, 8½ feet long and having a circumference of 4½ feet, which he provisionally identified as *Carcharhinus lamia*. He has twice before, once at the Cape and once at Beaufort, taken sharks which he thinks to be identical with this one. If this provisional identification is corroborated, another new shark will be added to the fish fauna of our coast through the work of Mr. Coles. In this connection the conjecture may be offered that there are probably to be found at the Cape other sharks which have never yet been noted as occurring in our waters.

* I must again express my great indebtedness to Dr. H. M. Smith's Fishes of North Carolina, a work invaluable to the students of the ichthyological fauna of North Carolina.

Carcharias littoralis (Mitchill).

SAND-BAR SHARK.

This shark, not very common at the Cape, is rare in the Sounds, so much so that although I have sought for it, I have never yet seen a specimen to know it as such. Coles on July 9 took a male 7 feet 6 inches long at the Cape. He states that he has occasionally taken them there with the lance. The above specimen does not seem to have been full grown, for according to Smith (1907) two 9-foot specimens were collected by H. H. Brimley at Beaufort in 1900, and in April, 1904, another of about the same size was taken at the Cape.

Squalus acanthias Linnæus.

PICKED DOG-FISH; "BONE SHARK."

The third recorded taking of this shark in the waters of North Carolina is by Mr. Coles, who hooked a specimen in 6 fathoms of water off the rocks of New River Inlet in January, 1912. For previous records see my "Notes No. I for 1910–11." The fish above referred to was presented to the United States National Museum.

Rhinobatus lentiginosus Garman.

GUITAR-FISH.

While it is known that the guitar-fish is found in the Beaufort region, captures of it are very unusual, the only record at the laboratory being of the taking of a 2-foot specimen in the inner harbor on July 6, 1899. However, on July 23, 1912, Coles took 2 female specimens each 30 inches long at the Cape. One was presented to the American Museum of Natural History, and the other to the British Museum. Two days later he took a third, a male 17½ inches long, which is now on deposit in the United States National Museum. Coles states that these are the first that he has ever taken on our coast, and that they were entirely unknown to the fishermen living at the Cape. In his paper (1913) he notes that this ray is viviparous.

Raja lævis Mitchill.

BARNDOOR SKATE; SMOOTH SKATE; WINTER SKATE.

During the later part of December, 1912, Coles took at New River Inlet a large female specimen of this skate measuring 34½ inches wide, 31 inches long (disk only), with 19½-inch tail—total length 48 inches. This specimen, which is now on deposit in the American Museum, was foul-hooked in the edge of the pectoral, but was fortunately secured. Not so however a male of about the same size, which, having swallowed the lead attached to the line (Mr. Coles was bottom-fishing at the time), was brought to the surface but cut the line and got away.

Smith (1907) says that this ray attains a length of 4 feet (Coles' specimen measured exactly 4 feet over all), and that it is not uncommon on our coast. It may have been more abundant in former times, or it may be a winter visitor, but in 9 summers' seinings in Beaufort waters I have

never taken one nor heard of one being captured. Furthermore, Coles states that in 11 years' fishing on our coast this is his first capture.

Narcine brasiliensis (Ölfers).

NUMB-FISH; "SHOCK-FISH."

In 1909 Coles added this fish to our ichthyological fauna by taking 2 specimens at Cape Lookout. In 1910 he captured 11 others, and in 1911 4 more. During the present year he obtained 16 specimens, 13 in the bight at Cape Lookout and 3 on the coast some miles south. One of these makes for us a new and unusual record for size, being 17¾ inches in total length and having a disk 9½ inches wide. Among these specimens were a number of pregnant females whose uteri with the contained eggs were sent to the American Museum.

Dasytis say (LeSueur).

STING-RAY; STINGAREE.

Although very common I took but one specimen, a female, during my brief stay at Beaufort. Its right ovary and right uterus were non-functional. The left ovary was filled with a number of eggs 4–5 mm. in diameter. The left uterus was much swollen, and internally was densely lined with villi the interstices of the bases of which were filled with a yellow buttery material. This uterus contained 2 rather far advanced embryos whose attached yolk bags were reduced to about the size of .44-caliber bullets.

The asymmetry of the reproductive organs of this specimen accord with what I have previously noted (1912) on others of this ray. It seems that the organs on the left side only are functional in rays of the genus *Dasyatis*. So I have found in dozen of specimens young and old of *D. say* examined at Beaufort, and in 7 specimens (all adult) of *D. hastata* examined during the summer of 1912 on the outermost of the Florida Keys. Wood-Mason and Alcock (1892) found the like on dissection of 2 females of *Trygon* (*Dasyatis*) *walga*. In speaking of *T.* (*D.*) *bleekeri*, Alcock writes (1892) of three specimens "* * * left side only pregnant; in all the pregnant rays that I have since dissected, where only one oviduct is pregnant it is always the left." Redeke (1898) found the same state of things in *Trygon pastinaca*, and he reports that according to Schmidt the same is true of *T. violaceus* (reference not verified). And later still Lönnberg (1902), on dissecting a female *Dasybatus margarita* from the west coast of Africa, found the left uterus only pregnant.

On this point Hill (1851), the earliest writer on these subjects known to me, says, "Some of the viviparous Cartilaginous Fishes are fertile only on one side generally the right." This I have found to be true only of the ovaries of the nurse shark, *Ginglymostoma cirratum*, and of a large tiger shark, *Galeocerdo tigrinus*, taken in Key West Harbor in July, 1912. However, I have found that in immature bonnet-head sharks, *Sphyrna tiburo* the right ovary is larger than the left. Redeke (1898) says that this is true of the right ovary of *Scyllium*, *Pristiurus*, *Mustelus*, *Galeus*, *Carcharias*, and *Sphyrna*.

Pteroplatea maclura (LeSueur.)

BUTTERFLY RAY; SAND SKATE.

This ray, like the preceding, is very abundant at Beaufort. In 1912, I took 4 female specimens in Newport River, all of about the same size, viz., 26 to 27 inches wide and 16 or 17 inches long to tip of ventrals. All had the reproductive organs on both sides functional, but the left ovary was in all cases better developed and the left uterus invariably contained more eggs than the one on the right. In all specimens a shell-gland could be found just anterior to the uterine enlargement. The uteri were on the interior closely crowded with richly vascularized villi, and were generally filled with a milky secretion.

Careful examination of the uterine eggs revealed some interesting structures. The left uterus of ray number I contained 3 yellow yolks enveloped in very thin diaphanous coverings but carrying neither blastoderms nor embryos. The middle one of the eggs had over one end only a fragment of egg shell. The most anterior egg had at its front end a lobe about one-third as large as the main yolk mass. Around the isthmus joining these was a mass of delicate yellowish material, probably a piece of shell, and this had possibly caused a constriction of the yolk, although the main portion of the yolk was of itself as large as either of the other eggs. The right uterus contained an empty egg shell larger at one end and having the other somewhat folded and rolled up.

Ray number II had a left ovary whose volume was about 25 per cent greater than the right. The right uterus contained but one egg, which was enveloped in a delicate transparent shell of light straw color. On the soft light yellow yolk neither blastoderm nor embryo could be found. The left uterus, which was somewhat larger than the right, also contained but one shell, which however enclosed 2 yolks, each the size of that in the right uterus. On one of these yolks was found a very small embryo in the selachian stage. This is the first case of polyembryony (if it may so be called) which I have ever met with in my dissections of sharks and rays. However, such have been previously reported by others.

Home (1810) found a single egg shell of *Squalus acanthias* to contain 3 yolks. Haacke (1885) has at some length described polyembryony in 2 Australian rays, *Trygonorhina fasciata* and *Rhinobatus vincentianus*. Redeke (1898) has figured a polyembryonal capsule for *Trygon pastinaca*. Joseph (1906) examined an egg-shell of *Scyllium* having in it 2 yolks flattened at the point of contact. However, most remarkable of all is Swenander's (1907) account of finding in the uterus of the common northern mackerel shark, *Lamna cornubica*, "* * * above 40 pieces of peculiar structure stuck together, which on close examination were found to be egg-masses enclosed in a common shell." While Vayssiere (1909) 2 years later obtained, from the left oviduct of a shark of the same species, a large egg-shell 34 x 92 mm., which on being opened was found to contain 2 yolks each having on it an embryo 15–16 mm. long and perfectly normal in all respects.

The reproductive organs of the third butterfly ray were functional on

both sides but better developed on the left. The right uterus had one egg, the left 2. The right egg and one of the left ones had perfect shells, with chalaza-like twisted and crumpled ends enclosing yolks with embryos in the early selachian stage. The other egg in the left uterus had the shelly material equatorially girdling and somewhat constricting it.

In the fourth ray both uteri were pregnant, but the left was twice as large as the right. Dissection being impossible at the time, both uteri were preserved but have since unfortunately been lost.

From all this data it seems not improbable that *Pteroplatea maclura* is intermediate in stage between those rays having perfect bilaterality of the reproductive organs, and those like *Dasyatis say* having complete asymmetry in favor of the left side only.

Aetobatus narinari (Euphrasen).

SPOTTED STING-RAY.

The specimens of this ray taken by Coles at Cape Lookout during the past summer are chiefly remarkable for their great size and for their beautiful markings. Three giants were taken: the first, a female, was 9 feet 6 inches long over all, 7 feet 2 inches wide, and 18 inches thick; the second, a male, measured 10 feet over all, 6 feet 11 inches wide, and 17 inches thick; the third and largest, a female, was 12 feet in extreme length, 6 feet 11 inches wide, 20 inches thick, and was estimated to have weighed approximately 500 pounds.

Mr. Coles was fortunate in getting some excellent photographs of the second of the rays noted in the preceding paragraph, and these have been finely reproduced in his 1913 paper. These rays were beautifully marked, the hinder half of the body of each being covered not with white spots but with white ocelli with dark centers.

In Mr. Coles' 1910 paper it is noted that the mother gives birth to the young while leaping in the air. None of these young however were secured. In 1912 Coles had the good fortune to catch a large female (number 2 above) which gave birth to 4 young which were evidently nearing the time when they would have naturally been set free. In the photographs of the just spawned young the heads are very light in color, but in that made of a young one preserved in formalin the head is as dark as the body and the spots are few and rather indefinite. This change in the ground color is due to the action of the preserving fluid. One of these young was 286 mm. wide, 171 mm. long, and had a very slender tail 634 mm. long. These are the first and only figures which have ever been made of the young of *Aëtobatus narinari*.

Myliobatis freminvillei Le Sueur.

EAGLE RAY.

Dr. Smith (1907) gives but brief data for this ray, noting that it is apparently not common in North Carolina waters. At Cape Lookout in 1909 Coles captured a female which gave premature birth to six young. In 1912 (Coles 1913) he took 11 specimens, one being a female with 6 young. One of these young was 203 mm. wide, 124 mm. long, with a

tail measuring 335 mm. Viviparity in this ray is effected by a uterus lined with villi presumably secreting a milk for the nourishment of the young.

Rhinoptera bonasus (Mitchill).

COW-NOSED RAY; WHIP-RAY; "WHIPPAREE."

Two specimens of this interesting ray were collected by me in Newport River. The first, which was about 26–28 inches wide, was a male in full breeding condition possessed of the most enormous testis I have ever seen in any ray. Both lobes reached forward clear to the anterior portion of the stomach, extending nearly from one end of the abdominal cavity to the other.

The other specimen was a female, 28 inches wide, 18 inches long to the tips of the pelvic fins, and had a tail 23½ inches in length. The oviducts were non-fertile and almost indistinguishable. The large ovaries presented 2 interesting structures. They were paired but the dorsal side of the left one only contained a large number of smallish eggs, was "warty" with them as my notes put it. In the hinder part of the abdomen was found a median unpaired lobe of the ovary attached to the median line but seeming to fall to the left in order to lie at ease.

This ray is not an unusual one at Beaufort. Both these specimens, like others previously examined by me, had the intestine and spiral gut filled with clams without a trace of shell.

Mobula olfersi (Müller & Henle).

SMALL DEVIL-FISH.

As on preceding summers, Coles was very successful in taking these interesting rays, capturing no fewer than 11. The periodicity of migration of these rays is very interesting. At the Cape in 1910 Coles took 9 between July 6 and 9; in 1911, 14 between July 6 and 29; and in 1912, 7 between July 7 and 29. He thinks that Cape Hatteras is their northern limit of migration. One of the 1912 specimens contained an embryo about 2 inches in diameter, but since this was spawned in the seine it was unfortunately lost.

GANOIDEI.

Acipenser oxyrhynchus Mitchill.

SHARP-NOSED STURGEON.

There have been reports of the occasional capture of sturgeons in the Beaufort region, but such are rare. In 10 seasons' collecting and study of fishes there I have never until the present summer caught any or heard of any being taken. On May 24 I took 2 young specimens at Rockfish Rock in the Narrows of Newport River. Here, where the fresh-water river enters the head of the estuary of the same name, the water was at this time hardly more than medium brackish.

One of these sturgeons was 17 inches long over all and had 10 dorsal plates, 27 lateral, and 11 ventral ones. The other was 17¾ inches long and its plates were, dorsal 10, lateral 28, ventral 11. In color both were

gray above, cream below. They are now on deposit in the Beaufort laboratory.

Prior to this there are only 2 records of the taking of this sturgeon in Beaufort waters. In 1877 Yarrow reported its capture in North River some 4 or 5 miles from Beaufort. Smith (1907) in April, 1904, saw three small specimens taken in the ocean at Cape Lookout. However, Mr. Coles informs me that the young are very common at Cape Lookout where they are taken in sink nets in March or early April in such numbers as to be at times unsaleable. He has seen the beach there covered with those that had been thrown away. Jordan (1886) reports the occurrence also of the sharp-nosed sturgeon *A. brevirostrum* in Beaufort waters.

The long-nosed sturgeon reaches a large size in our Sounds. In the summer of 1906 I examined at Hatteras the skins of 2 specimens which were reported by Dr. Davis, at whose fish wharf they were lying, to have been 9 and 11 feet long respectively. They were taken in Pamlico Sound.

Lepisosteus osseus (Linnæus).

GAR PIKE; LONG-NOSED GAR; "SHELL GAR."

I have previously (1910, 1912*a*) noted the prevalence of gars at the head of the estuary of Newport River. This season they were more abundant than ever, very greatly to the annoyance of the fishermen. Their occurrence in such numbers is probably to be explained on the ground that the water was almost fresh, due to the excessively heavy rainfall of the preceding weeks. Although the fish were in prime condition, neither milt nor spawn could be obtained by vigorous pressure.

TELEOSTEI.

Felichthys felis (Linnæus).

GAFF-TOPSAIL CAT-FISH.

In 6 seasons' seining for these cat-fish in Newport River they have never been found so scarce as in the last days of May, 1912. This is probably due to the extraordinarily heavy rainfall which immediately preceded my visit to Beaufort. The total rainfall from May 6–22 inclusive was 7.51 inches; the precipitation being 1.17 inches on May 6, 2.09 inches on 12, 1.74 on 13, and 1.31 on May 22, the day of my arrival. This so freshened the head of the estuary that the cat-fish were scattered over the wide reaches of the lower and more salt river. Confirmatory of this conclusion was the report of some of the menhaden fishermen that unusual numbers of cat-fish were taken in their seines outside. A female caught at the Narrows on May 23 had a large number of empty follicles in her ovary showing that oviposition had already begun.

Eel—species unknown.

It may not be amiss to note that an unidentified male eel, taken at the Narrows of Newport River on May 24, had a greatly enlarged testis extending forward through the whole length of the abdomen to the anterior end of the stomach.

Tarpon atlanticus (Cuvier & Valenciennes).
TARPON; "SILVER FISH."

Tarpon, while recorded from Beaufort, are sparingly taken. So far as I know, since 1902 no tarpons have been seen or any captures made until during the past year. In September, 1911, a specimen 52 inches long and weighing 60 pounds was taken in a seine in the channel between Fort Macon and the outer edge of Bird Shoal. A photograph of this fish, made by Mr. A. D. Dart of Beaufort, is now in my possession. On the day following the capture of the above, another about the same size was hooked outside the Inlet but broke away.

On May 24, at Lawton's Rock at the head of Newport estuary, we took a young specimen in a seine. The fish seemed to be known to my head fisherman, for, long before it became visible, he remarked that the big fish, striking the bunt of the seine so hard and threatening to tear its way out, was a silver fish. This specimen was 38½ inches long over all, 31½ to the base of the caudal, and its depth was 7½ inches. The head was 7¾ inches long, the diameter of the eye 1⅛ inches, and the long dorsal ray was 8 inches in length. It is interesting to note that the dorsal fin had 11 rays instead the 12 normally present. Its weight was 14½ pounds. When dissected it was found to have a very long air bladder, on the dorsal and ventral surfaces of the inner lining of which were found elongated bands of deep red vascular tissue, very lung-like in appearance, cellular and spongy, recalling vividly the figures of the air bladder of *Ceratodus*.

In size this 38½-inch fish was a mere baby. In July, 1906, at Hatteras, I saw a 5-foot specimen taken in a pound-net in Pamlico Sound. The largest recorded from the coast of North Carolina was taken near Wilmington. It weighed 176 pounds, but this is not the limit by any means. According to C. F. Holder (1903), the undisputed authority on the big game fishes of the United States—and the tarpon is *par excellence* the greatest game fish on the Atlantic and Gulf coasts, taking the place there of the tuna in California—the largest tarpon ever taken with rod and reel in the waters of the United States weighed 213 pounds and measured 7 feet 2 inches in length and 46 inches in girth. It was captured at Bahia Honda, Florida Keys, in 1901. In the same year a tarpon was taken at Aransas Pass, Texas, 7 feet 10 inches long and having a girth of 46 inches. Unfortunately this fish was not weighed but, according to the formula that the square of the girth in inches multiplied by the length in inches divided by 800 equals the weight in pounds, it was estimated by Holder at 233 pounds. These however are not maximum fish, for a specimen of 383 pounds has been grained according to Evermann, and Holder is convinced that not even this is the limit.

Smith (1907) tells us that the tarpon is not uncommon at Cape Lookout in May, but that it is rarely caught since it breaks through the nets. Coles took an 83-pound specimen there in the summer of 1912. He reports that tarpon are by no means rare there, that he has seen them in great numbers, and that he has gotten a net around them a number of times. However the above specimen is the only one he has ever caught since they are so strong that they either go through the net or leap over the cork line.

Scomberomorus cavalla (Cuvier.)

CERO; KING-FISH.

Since the passage of a law forbidding the use of mile-long seines in the bight of Cape Lookout, the cero has not cut much figure as an export food fish, being taken sparingly in the smaller seines or by trolling. Hence it was that the following press dispatch caught my attention.

"Morehead City.—Record-breaking catches of fish are being made here daily * * *. F. G. Willis caught 65 cero and king mackerel weighing 1200 pounds and Willis Fulcher caught 66 weighing 1200 pounds. By 7 o'clock that evening there was on the floor at Wallace's fish house over 5,000 pounds of cero, caught with hook and line by 4 people. This is the largest day's catch of this variety of fish ever made here."

In order to ascertain the correctness of this item I sent it to my friend, W. M. Webb, Esq., of Morehead City, who as it turns out is one of the 4 men referred to and who vouches for the accuracy of the statements. In addition Mr. Webb kindly communicated further the following interesting account.

"This is the first season we have ever fished exclusively for cero and I was in a party of 4 that made the first catch of 51 which weighed 1,168 pounds. For several days after this the sea was rough and we could not get out, but about a week afterwards, when every one thought the cero had gone south, I went out and caught 19 Friday, Oct. 25, 17 Saturday, 47 Monday, 66 Tuesday, 20 Wednesday, and 10 Thursday (about 3 hours in the afternoon). All were caught trolling, using whole mullet for bait. I am quite sure that we can get the cero fishing almost any day from about the middle of July up to November 1."

Auxis thazard (Lacepede).

FRIGATE MACKEREL.

Seriola carolinensis Holbrook

RUDDER-FISH; SHARK PILOT.

Seriola lalandi Cuvier & Valenciennes.

AMBER-FISH; YELLOW TAIL.

Caranx bartholomæi Cuvier & Valenciennes.

YELLOW JACK

Chloroscombrus chrysurus (Linnæus).

BUMPER.

It is interesting to note that Coles reports these fishes, for which there are very few Beaufort records, as being not uncommon at Cape Lookout. He took a number of specimens of each in 1912.

Decapterus punctatus (Linnæus).

SCAD; ROUND ROBIN.

This mackerel scad, which reaches a length of 12 inches and which is said by Jordan and Evermann (1896) to range from Cape Cod to Brazil and to be very common on the coast of Florida, has not heretofore been reported

from our waters. Concerning it Mr. Coles writes: In 1912, I secured my first specimen of this fish (8 inches long) from Cape Lookout and presented it to the American Museum." This is the fifteenth species which Mr. Coles has added to the fish fauna of North Carolina.

Rachycentron canadus (Linnæus).

CABIO; CRAB-EATER.

The record cabio for Beaufort and for the coast of North Carolina was taken by Mr. Dan Fowle while fishing in the ocean between Beaufort Inlet and Cape Lookout in October, 1911. It was 61 inches long and weighed 70 pounds. Large ones are often taken in seines at Cape Lookout but none so large as this has ever been recorded. I am indebted to Mr. A. D. Dart for a photograph of this fish and for the data above given.

Cynoscion regalis (Bloch & Schneider).

TROUT; SEA TROUT; GRAY TROUT.

Cynoscion nebulosus (Cuvier & Valenciennes).

TROUT; SEA TROUT; SPECKLED TROUT; SALMON TROUT.

These sea trouts are among the most common food fishes at Beaufort, the latter however being the more abundant and valuable. Hence it was that a recent press notice, similar to but more indefinite than the one previously quoted concerning the cero, led me to ask my friend, Captain J. H. Potter, a fish dealer of long standing at Beaufort, for more definite data. This through his kindness is now presented.

The fishing fleet at Beaufort at present comprises 20 to 25 vessels of from 40 to 70 tons displacement each, and it is not an infrequent thing for them to make catches of from 5,000 to 30,000 pounds of fish each several times a week during the height of the fishing season. This winter fishing is best at or near the bar across Beaufort Inlet, and sink or purse nets are used since the fish are found in large schools, each kind to itself. On the days referred to in the press dispatch, the fishermen were fortunate in striking immense schools, and it is estimated that 600,000 pounds were taken. Capt. Potter himself bought 70,000 pounds of gray trout in one lot for which he paid $1,000, while for another and smaller lot he paid $400. Other lots were sold to other dealers for $780, $650, and so on down to the smallest lot, which brought $150.

Of this great catch the spotted trout aggregated about 50,000 pounds and were sold for about $3,000, the price averaging 3 to 4 times higher than the price for gray trout. Capt. Potter says that this is the largest catch of spotted trout he has ever known at Beaufort, since fishing for them is generally by haul nets or they are taken in small quantities in purse seines by the menhaden fishermen while they are feeding on the menhaden.

Balistes carolinensis Gmelin.

TRIGGER-FISH; TURBOT.

The only published record of the occurrence of this trigger-fish in North Carolina is found in Smith's Fishes, where on page 340 it is noted that

one was taken in 1903, and 2 in 1905. At Cape Lookout in July, 1912, Coles had the good fortune to take 3 specimens, the largest of which was a foot long. These are the first and only specimens he has ever taken in his fishing on our coast.

Lactophrys trigonus (Linnæus).

CAMEL-FISH; TRUNK-FISH; BOX-FISH.

This interesting West Indian armor-clad fish has been sparingly taken at Beaufort, and not at all in recent years so far as the records go, hence the following quotation from Mr. Coles is of interest: "I secured my first specimen ($3\frac{1}{4}$ inches long) from Cape Lookout in 1912 and presented it to the American Museum."

Lactophrys tricornis (Linnæus).

COW-FISH.

In another paper (Gudger 1912*b*) record has been made of the addition of this interesting fish to our local fauna by Coles's fortunate catch of 2 small specimens at Cape Lookout in July, 1911. To these he has added another specimen taken at the same place in July, 1912.

Lagocephalus lævigatus (Linnæus).

PUFFER; RABBIT-FISH.

Coles reports that during the summer of 1912 he took at the Cape a number of good-sized specimens of this, our largest puffer. He finds however that, while it is more abundant at Cape Lookout than at Beaufort, it is solitary in habit since he has never found more than one to be taken at a time.

Scorpæna brasiliensis Cuvier & Valenciennes.

SCORPION-FISH.

A large specimen of this fish was taken at Beaufort on August 10, 1911. After being in alcohol until May 29, 1912, it measured $6\frac{1}{8}$ inches over all, and $1\frac{3}{4}$ inches in depth. It is noticeable that its ventral fin had 5 instead of 6 soft rays, the normal number. The only other specimens ever recorded from Beaufort or our coast prior to this were collected by George Bean and myself on Uncle Israel Shoal in Beaufort Harbor, July 20, 1904. They were only about 2 inches long. However in July of this year Coles took at Cape Lookout a specimen which he presented to the United States National Museum, thus adding another record to our scanty list of its captures.

Prionotus evolans (Linnæus).

Prionotus tribulus (Cuvier).

Prionotus scitulus Jordan & Gilbert.

Prionotus carolinus (Linnæus).

FLYING-FISHES; FLYING-TOADS; SEA-ROBINS.

Coles reports that at the Cape in July, 1912, he was able to make a fine collection of sea-robins, as our American gurnards are commonly called.

Among these specimens, which were divided between the United States National Museum and the Museum d'Histoire Naturelle de Paris, were a number of the rare form *P. evolans*, specimens of which Coles also took at Cape Lookout in 1910 and again 1911 (Gudger 1912b).

Cephalacanthus volitans (Linnæus).

FLYING-FISH; FLYING-ROBIN.

Although this flying gurnard seems to have been abundant at Beaufort in the '70s and '80s, of late years it has been extremely rare. In the summer of 1904 I had the good fortune to collect a specimen, and in the following season another was taken by Dr. C. B. Wilson. On August 10, 1912, Coles took near Beaufort Inlet the first and only specimen of this gurnard in his 11 years' fishing on our coast. It is now in the United States National Museum.

Ogcocephalus nasutus (Cuvier & Valenciennes).

BAT-FISH.

Coles has added another fish to the fauna of North Carolina and indeed of the United States by the capture of a specimen of this rare bat-fish. This specimen, which was taken in a purse seine in the open sea between Beaufort Inlet and Cape Lookout, is $5\frac{1}{4}$ inches long. Heretofore it has not been taken north of the West Indies. This is the sixteenth, or if the identification of the cub shark, *Carcharhinus lamia*, be confirmed, the seventeenth, species which Mr. Coles has added to the ichthyological fauna of North Carolina. It is on deposit in the United States National Museum.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW PHILIPPINE FRUIT BATS.

BY N. HOLLISTER.

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Two new species of *Pteropus* have been found in the splendid series of fruit bats collected in the Philippine Islands by Dr. Edgar A. Mearns.

Pteropus balutus sp. nov.

Type from Balut Island, Serangani Group, south of Mindanao. U. S. National Museum No. 144760, skin and skull of ♀ adult, teeth much worn. Collected January 23, 1906, by Dr. Edgar A. Mearns. Orig. No. 6021.

Diagnosis.—Somewhat intermediate in characters between *Pteropus speciosus* and *Pt. pumilus*. Coloration of upperparts much as in *pumilus*, but slightly paler; size approaching that of *speciosus*, but slightly smaller, with noticeably shorter pollex.

Color of type.—Crown and anterior and posterior edges of mantle pale orange-yellow; center of mantle (nape and shoulders) darker, more ochraceous-tawny.* General color of back and rump wood-brown, a mixture of hairs of auburn and avellaneous; brighter and more reddish on hips. Throat buffy brown; breast, flanks, and anal region, ochraceous-tawny; middle belly buffy.

External measurements of type.—Collector's measurements: Length, 190 millimeters; alar expanse, 855. From dry skin: Forearm, 117.5; pollex, total length, c. u., 47.5; pollex metacarpal, 11.3; pollex first phalanx, 25; second digit, metacarpal, 59; first phalanx, 13; second-third phalanx, c. u., 12; third digit, metacarpal, 78.5; foot, c. u., 35.

Skull and teeth.—One side of the braincase and the mandible are so broken that only a few measurements are possible. The size and general characters of the skull seem essentially as in *Pt. speciosus*, with the rostrum more slender and interorbital breadth less. Front of orbit to tip of nasals, 18; least breadth of rostrum, 9.0; least interorbital breadth, 7.0. The teeth of the type are much worn, but appear to be as in *speciosus*.

* Ridgway: Color Standards and Color Nomenclature, 1912.

Remarks.—This small *Pteropus* appears to be nearest related to *Pt. speciosus* from Malanipa Island, but is readily separated from that form by its much lighter color, above and below, and by the distinctly smaller pollex. From *Pt. pumilus*, of Palmas Island, which it greatly resembles in the color of the upperparts, it differs in its decidedly greater size. The single specimen was "found in the forest clinging to branch of deciduous tree."

Pteropus mearnsi sp. nov.

Type from Isabella, Basilan Island. U. S. National Museum No. 144739, skin and skull of ♂ adult. Collected January 26, 1906, by Dr. Edgar A. Mearns. Orig. No. 6024.

Diagnosis.—A member of the *hypomelanus* group. Coloration almost exactly like the darker specimens of *Pteropus hypomelanus cagayanus;* size considerably less, with much smaller skull.

Color.—Muzzle and head mummy-brown, lighter on crown; mantle chestnut; back and rump brownish black with wash of rusty. Breast Hessian brown, mixed with blackish; flanks and lower belly dark chestnut brown, with much blackish; center of belly lighter, golden ochraceous. Five adults are very uniform in color; a single young example has a much lighter mantle.

Skull and teeth.—Skull about intermediate in size between skulls of *Pteropus speciosus* and *Pt. h. cagayanus*. In general like skull of *cagayanus*, but considerably smaller, with relatively much larger braincase. Teeth essentially as in *cagayanus*.

Measurements of type.—Forearm, 123; pollex, total length, c. u., 55; second digit, total length, c. u., 89.5; third digit, metacarpal, 82.5; third digit, first phalanx, 61; foot, c. u., 41. Skull: Condylobasal length, 53.4; zygomatic breadth, 34; breadth braincase at zygomata, 22.4; front of orbit to end of nasal, 19.5; orbital diameter, 12; least breadth rostrum, 10.2; interorbital breadth, 8.5; upper toothrow, entire, 28; upper molar-premolar row, alveoli, 15.4; mandible, 46.5; lower tooth row, entire, 27.8; lower molar-premolar row, alveoli, 21.5.

Remarks.—Except for its smaller size, *Pteropus mearnsi* greatly resembles *Pt. h. cagayanus;* and it is conspicuously different from all other Philippine species. In size it approximates *Pt. mimus*, but it differs greatly in color from that species. Six specimens have been examined, all collected by Doctor Mearns; four from Isabella, Basilan, and two from Zamboanga, Mindanao. The species apparently replaces the widely ranging *Pt. h. cagayanus* in these localities.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SHREW FROM BALTISTAN.

BY GERRIT S. MILLER, JR.

[By permission of the Secretary of the Smithsonian Institution.]

Four specimens of a pale gray shrew of the genus *Crocidura* collected by Dr. W. L. Abbott in Baltistan represent a species distinct from those previously described. The animal may be known as

Crocidura pergrisea sp. nov.

Type.—Adult female (skin and skull), No. 175918, U. S. National Museum. Collected at Skoro Loomba, Shigar, Baltistan (altitude 9500 feet), October 16, 1912, by Dr. W. L. Abbott. Original number 8036.

Diagnosis.—Size and proportions about as in *Crocidura attenuata* as described and figured by Milne-Edwards,* but color a very pale gray, skull smaller than in the Chinese animal (greatest length 18.8–19.6 instead of 21 mm.) and crown area of first unicuspid fully equal to that of second and third combined.

Color.—Hairs everywhere blackish-slate from base to within about 1.5 mm. of tips, this dark area followed by white with a faint creamy tinge, and this in turn on dorsal surface by the hair-brown tips. The general effect on underparts is a creamy white with irregular slaty clouding, that on upperparts pallid neutral-gray faintly washed with hair-brown. Feet and tail whitish, the tail with a dusky area on dorsal surface at tip but not including pencil.

Skull and teeth.—Viewed from above or below the skull resembles that of the common *Crocidura pullata* of Kashmir except that the braincase is narrower. In lateral aspect it is conspicuously lower throughout, and in two of the three skulls there is a slight but evident concavity in the interorbital region.

Teeth not obviously different from those of *C. pullata*, the small unicuspids subequal, with the first inclining to be slightly the larger, the crown area of the two small teeth together not greater than that of the large anterior unicuspid.

* Rech. Hist. Nat. Mamm., vol. 1, p. 263, pl. 38B, fig. 1; pl. 39A, fig. 2.

Measurements.—Three adult females (those of the type standing first): head and body, 72, 75, 75; tail, 53, 54, 53; hind foot, 12.6, 12.6, 12.6; condylobasal length of skull, 19.0, 19.4, 19.2; zygomatic breadth, 4.0, 4.0, 4.2; breadth of braincase, 8.8, 9.0, 8.8; depth of braincase, 4.4, 4.2, 4.4; mandible, 10.2, 10.4, 10.0; maxillary toothrow,* 8.6, 8.6, 8.6; mandibular toothrow, 8.0, 8.0, 8.0.

Specimens examined.—Four, all from the type locality.

Remarks.—This species differs widely from the members of the genus previously known to occur in British India. It appears to be a western representative of the group including *Crocidura attenuata* Milne-Edwards and *C. dracula* Thomas. The peculiar gray color is a character very unusual among shrews.

* Teeth slightly worn.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FIVE NEW PLANTS FROM NEW MEXICO.

BY PAUL C. STANDLEY.

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During the summer of 1912 only a few plants were collected in New Mexico, at least so far as is known to the writer. Prof. T. D. A. Cockerell has forwarded a small collection from the region about Santa Fe, in which there is an apparently undescribed species of *Nuttallia*. Mr. E. O. Wooton gathered a few specimens in the San Andreas Mountains in Dona Ana County, two of which, a *Chrysothamnus* and an *Amelanchier*, seem to be new. More careful examination of the southwestern specimens of *Amsonia* in the U. S. National Herbarium, at the suggestion of Dr. P. A. Rydberg, reveals two new species of this group, both of which occur in New Mexico, besides extending to adjacent States. Descriptions of these five species are published herewith.

Nuttallia springeri Standley sp. nov.

Stems slender, with numerous divaricate branches, white, scabrous-puberulent, glabrate in age; cauline leaves (basal ones not seen) small, 20 to 35 mm. long, sessile, bright green, scabrous-hirtellous, linear, the uppermost entire, the lower remotely dentate or laciniate-dentate, the teeth or lobes divaricate; flowers numerous, solitary at the ends of the branches, or rarely axillary, naked or subtended by 1 or 2 leaf-like bracts; hypanthium about 6 mm. long, the calyx lobes of about the same length, linear-triangular, long-attenuate, spreading or reflexed, scabrous-hirtellous; petals 12 to 15 mm. long, spatulate, obtuse, bright yellow, narrowed into a long claw, accompanied by usually 5 petal-like staminodia; stamens numerous, the filaments slender; capsules cylindric, 8 to 10 mm. long, scabrous; seeds flattened, 1.75 mm. in diameter or less, narrowly winged or only margined, pale brownish.

Type in the U. S. National Herbarium, No. 661,103, collected on the

mesa above the Abbott Ranch, Rito de los Frijoles, northwest of Santa Fe, New Mexico, in August, 1912, by Mr. Frank Springer (No. 4).

This proposed new species is related to *N. multicaulis* and *N. multiflora*, but in most of its dimensions it is smaller than either. *Nuttallia multiflora*, particularly, has much larger flowers, as well as broad and more dissected leaves. The seeds, too, are unlike those of the two species mentioned.

The specimens were forwarded by Prof. T. D. A. Cockerell. At his request, the species has been named in honor of its collector, Mr. Frank Springer, who is well known for his contributions to the science of paleontology.

Amelanchier australis Standley sp. nov.

Slender shrub 2 meters high or less with ascending branches; older twigs glabrous, brown or grayish brown, the younger ones tomentose or villous with white hairs; buds ovoid, more or less villous; leaf blades thick and coriaceous, ovate-oblong or rounded-oblong, 20 to 32 mm. long, 14 to 25 mm. broad, rounded to nearly truncate at the apex or sometimes acutish, broadly rounded or truncate at the base, pale dull green, villous on the upper surface with mostly appressed hairs, more densely villous or tomentose beneath, coarsely crenate-serrate above the middle, the teeth abruptly short-pointed; petioles slender, 5 to 7 mm. long, villous or tomentose; stipules 6 to 10 mm. long, subulate, reddish brown, villous, soon deciduous; racemes terminal, slender, sometimes somewhat paniculate, each with 6 to 15 flowers; pedicels slender, erect, 5 to 15 mm. long, densely villous with mostly appressed hairs; hypanthium in anthesis campanulate, bright green, sparingly villous; calyx lobes bright green, lanceolate to narrowly elliptic or linear-lanceolate, 4 to 5 mm. long, acute, villous on both surfaces, after anthesis reflexed or spreading and accrescent, equaling or exceeding the fruit; petals narrowly oblong or elliptic-oblong, narrowed at the base, obtuse, 5 to 6 mm. long; mature fruit not seen, the best developed immature ones spherical, slightly villous, 5 to 6 mm. in diameter.

Type in the U. S. National Herbarium, No. 661,083, collected at Ropes Spring in the San Andreas Mountains, Dona Ana County, New Mexico, September 23, 1912, by E. O. Wooton.

This is as closely related to *Amelanchier oreophila* A. Nels. as to any New Mexican species. That, however, so far as now known, reaches only the mountains of the northern part of the State, occurring in the Transition Zone. The locality for *A. australis* is in the Upper Sonoran Zone. *Amelanchier oreophila* differs from this shrub of southern New Mexico in its thinner, bright green leaves, fewer flowers, and less abundant pubescence. The new species here described is best distinguished by its bright green, foliaceous calyx lobes, which are unlike those of any other North American species.

Amsonia arenaria Standley sp. nov.

Perennial from a thickened woody root; stems stout, erect, 14 to 50 cm. high, much branched above the base, the branches ascending or spreading, tomentose with branched white hairs; leaves numerous, linear, or the lowest rarely lance-linear, 20 to 55 mm. long, 3 mm. wide or less, acutish, sessile, thick and somewhat fleshy, 1-nerved, abundantly tomentose when young, glabrate in age; flowers numerous, in rather dense clusters, these shorter than the leaves; pedicels 4 mm. long or less, some of the flowers usually sessile; calyx 5 to 7 mm. long, tomentose, soon becoming glabrate, the lobes lanceolate, with long subulate tips; corolla salverform, the tube 8 to 10 mm. long, dilated upward, constricted at the mouth, glabrous outside, pubescent within, the lobes of the limb oblong or oblong-obovate, 8 mm. long, obtuse, spreading; stigma spherical, with two rounded lobes above; follicles stout, 4 to 9 cm. long, constricted between the seeds, attenuate at the apex, sessile, tomentulose when young, glabrate in age, 1 to 3-seeded; seeds 8 to 23 mm. long, elliptic or narrowly oblong in outline, obtuse or truncate at the ends, pale brown.

Type in the U. S. National Herbarium, No. 661,049, collected on sandhills between Strauss and Anapra, near the southeast corner of Dona Ana County, New Mexico, in July, 1912, by Elmer Stearns (No. 372). The locality is near El Paso, Texas, on the west side of the Rio Grande.

The type specimens bear fruit only, and the description of the flowers is based upon Pringle's 6796 and part of the Mexican Boundary Survey's No. 1053, cited below.

Amsonia arenaria is nearest *A. tomentosa* Torr., and some of the material referred here was determined as that species by Gray and Torrey. The two occupy entirely different ranges, *A. tomentosa* being known only from northern Arizona, southern Utah, Nevada, and southern California. The latter has lanceolate to ovate leaves which are permanently tomentose and give the plant a whitish appearance that is characteristic even in age. *Amsonia arenaria* is somewhat grayish when young, but soon loses most of its pubescence and appears a dull dark green.

Additional specimens examined:

New Mexico: On sandhills, San Andreas Mountains, Dona Ana County, September 23, 1912, *Wooton*.

Chihuahua: Between Laguna de Guzman and Laguna de Santa Maria, 1891, *Hartman* 724; gravelly plains near Lake Guzman, alt. 1200 meters, 1898, *Pringle* 6796.

Without definite locality: *Mexican Boundary Survey* 1053, in part.

Upon the National Herbarium sheet of No. 1053 collected by the Mexican Boundary Survey are three branches, each representing a different species. One is *Amsonia arenaria*, another is *A. hirtella*, and the third represents an apparently undescribed species. This last is perfectly glabrous and resembles *A. longiflora*, but the flowers are much smaller than in that species. It is probably the plant from Lake Santa Maria, Chihuahua, referred to by Torrey* as a glabrous form of *A. tomentosa*.

*U. S. and Mex. Bound. Bot. 158. 1859.

Amsonia hirtella Standley sp. nov.

Perennial from a somewhat woody root; stems stout, erect, 50 cm. high, with rather few erect or ascending branches above the middle, abundantly hirtellous; leaves narrowly lance-linear, 30 to 45 mm. long, 2 to 5 mm. wide, acute, attenuate to a petiole-like base, abundantly hirtellous, especially on the margins and veins; flowers numerous, in dense terminal or lateral clusters, usually exceeding the leaves; pedicels short, 2 mm. long or less, densely hirtellous; calyx 5 to 6 mm. long, glabrous or nearly so except for the long linear hirsute tips of the linear-lanceolate lobes; corolla tube about 14 mm. long, dilated upward, constricted at the mouth, villous within; corolla lobes oblong or oblong-oval, 5 to 6 mm. long, obtuse.

Type in the U. S. National Herbarium No. 691,857, collected in canyons near the Upper Corner Monument, southern Grant County, New Mexico, May 1, 1892, by Dr. E. A. Mearns (No. 117).

This plant seems to be most closely related to *Amsonia longiflora* Torr. That species is glabrous throughout and has flowers nearly three times as large.

The writer would refer here provisionally the following specimens:

Chihuahua: Candelaria, 1911, *Stearns* 228.

Texas: Bofecillos, May 18, 1881, *Havard.*

Without definite locality: *Mexican Boundary Survey* 1053, in part.

These last three specimens all have young or mature fruit and no flowers. The fruit is slenderly cylindric, continuous, with no constrictions between the seeds, glabrous, 8 cm. long or less. The pubescence of the leaves and stems is similar to that found in the type of *A. hirtella*, but it is more abundant and is scattered all over both surfaces of the leaves. The calyx, too, is densely hirtellous throughout. When the corollas of this form are seen, it may be found that the plant from farther east and south is really a different species.

Chrysothamnus elatior Standley sp. nov.

Slender shrub 1 meter high or less; older branches whitish, striate, puberulous or glabrate, erect; leaves numerous, erect or ascending, linear, 20 to 25 mm. long, 2 mm. wide or less, acutish, sharp-pointed, narrowed at the base, the uppermost narrower, shorter, and with more or less involute margins, all thick, rigid, finely and densely puberulous with white hairs; inflorescence rather densely corymbose, composed of few to many heads; peduncles ascending, 5 to 13 mm. long, puberulous, furnished with short bract-like leaves; involucres narrow, 9 to 12 mm. high, 5-angled by the pentastichous bracts; these in 5 or 6 series, the outer successively shorter, the outermost oblong-lanceolate and acute, the inner linear-oblong, abruptly acuminate to a slender tip, all somewhat coriaceous, pale, with short green tips; flowers usually 5; corolla slender, 12 mm. long, glabrous; achenes glabrous, 6 or 7 mm. long, 5-angled, with a prominent nerve on each face; pappus yellowish white, rigid, about 14 mm. long.

Type in the U. S. National Herbarium, No. 661,098, collected on sandhills north of Goldenbergs Ranch, San Andreas Mountains, Dona Ana County, New Mexico, October 12, 1912, by E. O. Wooton.

This belongs to a group of which three other species occur in New Mexico, *Chrysothamnus pulchellus* (A. Gray) Greene, *C. depressus* Nutt., and *C. baileyi* Wooton & Standley. All of these are much lower plants than our new species, seldom exceeding a height of 30 cm. *C. depressus* is found only in the northern part of the State. It has broad leaves which are merely scaberulous, and thin, long-acuminate bracts. *Chrysothamnus pulchellus* and *C. baileyi*, both of which grow in eastern and southern New Mexico, have glabrous leaves and broader, more obtuse bracts.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOVITATES FLORAE UTAHENSIS.

IVAR TIDESTROM.

During the month of June and the early part of July, 1909, duties took me over the very interesting region—the Kaibab Plateau—lying east of Kanab, Utah. The region is part of the Buckskin Mountains, and it is essentially a yellow pine area, except in the immediate vicinity of the basin, or at 1500 m. elevation, and above 2700 m. where spruces and firs abound.

Among the yellow pine I found among other plants very interesting specimens of Aquilegia,* one of which was described as *A. pinetorum*. Along with this species I found also a Delphinium which I have not been able to refer to any of the hitherto known species and for which the following diagnosis is proposed:

Delphinium pinetorum sp. nov.

Perennis (?) e radice tuberifera, 2–4 dm. altitudine, deorsum pubescens vel glabrescens, sursum pubescens: caules pauci: folia radicalia tenuiter petiolata; laminis 2 cm. plus minusve latis, ternatis, partibus fere ad basin divisis, laciniis linearibus 1 mm. plus minusve latis, apice albido-calloso: folia caulina simpliciora: flores azurei in racemo simplici; pedunculis tenuibus ascendentibus, bracteis filiformibus quam pedunculis brevioribus: calcar aliquantulum curvatus sepala superans; sepalis oblongis acutis azureis vel coeruleis; petala superiora albida, emarginata purpureo-venosa; inferiora azurea barbata bifida: carpella terna sericea, matura fere erecta 1 cm. v. longiora. Floret Junio altitudine 2400 m.

Type in the U. S. National Herbarium [Tidestrom 2375], collected at an altitude of 2400 m. on the Kaibab Plateau, northern Arizona, where it grows among *Pinus ponderosa*. Also collected on the Uncompahgre Plateau near Ridgway, Colorado [Tm. 2140], and in the La Sal Mountains, eastern Utah, by Mr. Mellenthin of the Forest Service.

Distinguished by the linear, sometimes filiform lobes of its leaves. It

*See Amer. Midland. Natur. 1: 165, 1910.

ranges so far as known from the Uncompahgre Plateau westward into the La Sal Mountains and southward towards the San Francisco Mountains of Arizona. It has been observed at an elevation of 2100 m. upward to 3000 m.

Eriogonum Kearneyi sp. nov.

Fruticulosa, multicaulis, 3 dm. v. altior: caules tomentosi, infra mediam foliati: folia petiolata elliptica; petiolis 1 cm. longis v. brevioribus basi dilatatis; laminis ca. 2.5 cm. longis 1 cm. latis, supra sparse, subtus dense tomentosis, mucronatis, margine integra: inflorescentia (dichasium decompositum) internodiis primariis rectis circa 5 cm. longis, secundariis brevioribus; floribus paucis, parvis, involucro campanulato dentato dense tomentoso; pedicellis 1.5 mm. longis; perianthii lobis inaequalibus 1 mm. plus minusve longis obovatis inaequaliter denticulatis albidis vel roseis: ovarium lineare, stigmatibus tribus: fructus ignotus.

Type in the U. S. National Herbarium, Kearney and Shantz No. 3218, collected on the sandhills 3 miles west of Toele, Utah, growing with *Psoralea lanceolata*.

This is one of the many interesting species collected by Messrs. Kearney and Shantz. It is readily recognized by its white tomentum, by its inflorescence [a decompound dichasium], which latter forms fully the upper half of the plant. The lower branches of the inflorescence are straight, forming with one another an angle of about 45° more or less.

Oreocarya Shantzii sp. nov.

Perennis, spithamea, caespitosa, multicaulis: caules strigosi, pubescentia pilis albis intermixta, infra mediam foliosi, supra thyrsiflora: folia spatulato-linearia 2 cm. longa, infra apicem 4 mm. lata, infra mediam linearia, dense strigosa: calyx dense hirsutus, lobis linearibus 4 mm. longis: corolla alba, tubo calycem paulo superante, limbo rotato, lobis rotundatis; nuculae elongato-ovatae, obtusae; dorso albido-punctatae.

Type in the U. S. National Herbarium, Kearney and Shantz No. 3098, collected in dry, saline soil at Grant's Station south of the Great Salt Lake, Utah, growing with *Atriplex confertifolia*.

Mertensia Sampsonii sp. nov.

Planta robusta glabra: folia radicalia vel infra caulis mediam oblanceolata 1 dm. longa vel breviora, punctata; alia ampliora sessilia, elliptico-lanceolata: inflorescentia paniculata; pedicellis lepidotis: calyx fere 5-divisus; lobis lineari-lanceolatis ciliatis 4 mm. longis: corolla coerulea 12 mm. longa, tubo cylindrico calycem paullo superante: intus basi villoso; limbo campanulato, rotundo-lobato tubum aequante: filamenta dilatata antheras aequantia: stylus inclusus 8–10 mm. longus, stigmate peltato: fructus ignotus.

Type in the U. S. National Herbarium, Sampson No. 677, collected in the Wasatch Mountains, east of Ephraim, Utah, at an altitude of 2850 m.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW WEASELS FROM THE UNITED STATES.

BY HARTLEY H. T. JACKSON.

The Biological Survey Collection contains specimens of two undescribed weasels which may be characterized as follows:

Mustela primulina sp. nov.

Type, subadult ♀, skin and skull, No. 168,006, U. S. National Museum, Biological Survey Collection, from 5 miles northeast of Avilla, Jasper County, Missouri; collected May 11, 1905, by Hartley H. T. Jackson. Original No. 552.

General characters.—A weasel of the *longicauda* group, characterized by its bright color, especially of the under parts. Differs from both *longicauda* and *spadix* in having the color of the back much darker; underparts yellow, *not buff*, and not continuous on feet and toes.

Color.—Upper parts Brussels brown,* darker on the middorsal line, slightly lighter on the flanks; hind feet uniform in color with back; soles and toes of fore feet white; tail unicolor with back, slightly lighter beneath, with distinct black tip; face and top of head dark warm sepia; chin white; ventral parts primuline yellow, slightly darker on the throat and midventral line; anal region Brussels brown.

Measurements.—Type ♀, flesh measurements of skin by collector: total length, (324.5); tail vertebrae (part gone), (89.5); hind foot, 44. Skull of type: interorbital constriction, 10; maxillary tooth row, 11.5; mandibular tooth row, 13.7. Skull of topotype, young ♂, No. 168,007: condylobasal length, 46.4; postorbital constriction, 11.7; interorbital constriction, 9.7; maxillary tooth row, 11.3; mandibular tooth row, 13.4.

Remarks.—The above description of *Mustela primulina* is based upon two imperfect specimens, a subadult ♀ and a young ♂. The two were killed by dogs, May 11, 1905, and were received by me several days later in a badly mutilated and decomposed condition. The skulls of both are crushed; the skin of the type specimen lacks about one-third of the tail; the skin of the topotype consists of the scalp only. Notes made at the

* Colors here used are those of Robert Ridgway in "Color Standards and Nomenclature," 1912.

time the specimens were received read: "Male received same date; some larger, much darker on the back and deeper, brighter yellow on the belly."

Mustela campestris sp. nov.

Type, adult ♂, skin and skull No. 171,490, U. S. National Museum, Biological Survey Collection, from Beemer, Nebraska; collected April 18, 1911, by Grover Sharp.

General characters.—Similar to *Mustela rixosus* in color but slightly paler; white of the underparts more extensive than in *rixosus* and encroaching upon the fore feet; toes of both front and hind feet white.

Color.—Upper parts uniform Prouts brown, slightly darkened on the face; tail same color as back, with a few white hairs in the tip; ventral parts white.

Cranial characters.—Skull about the size of that of *rixosus*, but narrower postorbitally; brain case narrower than in *rixosus* and depressed anteriorly; palate narrower than in either *rixosus* or *allegheniensis;* postpalatal notch short and narrow; audital bullae flatter and less angular than in *rixosus*, and the region between the audital bulla and the glenoid fossa less inflated.

Measurements.—Type ♂, flesh measurements of skin by collector: total length, 184; tail vertebrae, 32; hind foot, 19. Skull of type: condylobasal length, 30.9; zygomatic breadth, 15; postorbital constriction, 6.4; interorbital constriction, 6.2; maxillary tooth row, 7.1; mandibular tooth row, 7.9.

Remarks.—The description of this weasel is based upon a single specimen which was sexed "female" by the collector, but which, judging from cranial characters, is undoubtedly a male. Additional specimens from other localities may possibly show intergradation with *rixosus* or *allegheniensis.*

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE PIKAS OF COLORADO.

BY JUNIUS HENDERSON AND T. D. A. COCKERELL.

Ochotona saxatilis Bangs was originally described from Montgomery, near Mt. Lincoln, Park County, Colorado. So far as we are aware it has not been found outside of Colorado. Until recently all the pikas of that State were supposed to belong to this form. A year ago Dr. Allen described *Ochotona figginsi* from Pagoda Peak, Routt County, Colorado.* The type localities of these two forms are only about 90 miles apart, but are separated by a broad zone of territory entirely unsuited to pikas, which in the southern Rockies are seldom found below 9000 feet and are not usually abundant below 10,000. The *saxatilis* locality is connected with the Front Range and with the Sangre de Cristo Range by almost continuous altitudes of 9000 feet or over. Hence *saxatilis* should be expected all along the crests of the eastern mountains practically from the northern to the southern boundary of the State. On the other hand, the *figginsi* locality is in an isolated mountain area, separated on all sides from other high mountains by territory unfavorable to this genus, so one should expect a distinct race to develop there. The San Juan region to the southwest also forms a rather distinct mountain mass, but it is really connected with the eastern ranges by territory more or less favorable to pikas, so that it is not so likely that the San Juan pikas would be distinct, though by no means unlikely. The form which occurs in the range west of North Park may also prove to be distinct, though not as thoroughly isolated as the Pagoda Peak region. All of these topographic features will clearly appear to the reader unfamiliar with the region, upon consulting the new topographic map of

* Bull. Amer. Mus. Nat. Hist., XXXI, 103-104, May 28, 1912.

the State soon to be issued by the Colorado Geological Survey, a proof sheet of which had been furnished to us. The map will also aid in comprehending the geological history of the region which has led to the isolation of groups of plants and animals of restricted altitudinal range.

Owing to seasonal differences in pelage colors, as well as differences due to age, the diagnosis of closely related forms of this genus is difficult and unsatisfactory unless one has access to numerous specimens, representing various localities and various seasons.

In the University of Colorado Museum are two specimens taken at Trappers' Lake by Mr. A. H. Felger, of Denver, August 31, 1909, and three more in his collection, taken the same day at the same place. All are females and apparently all young, though full grown. Trappers' Lake is about nine or ten miles south of Pagoda Peak, and the two localities are connected by an unbroken mountain divide which should be just as favorable to these animals as either of the special localities mentioned, so far as one may judge by observing the divide from the valley, without actually traversing it. However, the description of *figginsi* does not exactly fit the Trappers' Lake specimens. This is likely due to difference in season, as the *figginsi* type was taken on October 30, two months later than the Trappers' Lake specimens, the former thus representing the winter pelage, while the latter represents the worn summer pelage. There is also considerable variation in the colors of the Trappers' Lake specimens themselves, due possibly to difference in age, though that is doubtful. Dr. Allen's comparison was based upon winter pelage.

We have compared these specimens with four from the Front Range, taken near timber line, west and southwest of Boulder, one on July 21, two on July 24, and one on August 26, hence all representing summer pelage. Individually some specimens from the two localities are scarcely distinguishable; collectively, with the two lots placed in separate rows, side by side, the difference is clear. This, as is well known, is often true of various forms of *Peromyscus*. Assuming that the Trappers' Lake lot are true *figginsi*, and that the Front Range lot are true *saxatilis*, the *figginsi* lot as a whole is considerably darker above than the *saxatilis* lot. This is owing to a larger proportion of black and

dark ochraceous mixed with the gray. This difference, however, is not uniform. One of the *figginsi* has rather more of the gray than one of the *saxatilis*, and these two, with another somewhat darker *figginsi*, form an almost complete series grading from one form to the other. Below, the *saxatilis* lot is nearly white, with a very light wash of buff, while *figginsi* has a stronger wash of ochraceous buff, especially well defined along the medial ventral surface, somewhat lighter in two specimens, these two being the same ones that are lighter above than the other three. In the ventral colors, as in the dorsal, we find an almost complete gradation between the two forms. It is notable that the difference in the ventral surface of the two forms is the exact reverse of that noted by Dr. Allen in the winter pelage. He says *saxatilis* is "pale buff, with the pectoral band approaching ochraceous buff; in *figginsi* it is white with a pale yellowish wash, a little stronger and more buffy on the pectoral band, but not of the deep buff seen in *saxatilis*." In other words, if our specimens are true *figginsi* and *saxatilis*, then the difference in the ventral surface in winter pelage is the exact reverse of the difference in summer pelage. The crowns of all our *figginsi* are much darker than in our *saxatilis*, and with a distinct vinaceous cast. In this respect the tendency to intergrade is much less than in any other respect. The following are the measurements in the flesh, in millimeters, which do not help us much:

	Length.	Hind Foot.	Tail.
Jenny Lake, Gilpin County,	192	26	
Jenny Lake, Gilpin County,	180	25	
Corona, Gilpin County,	185	30	
Camp Albion, Boulder County,	200	30	14
Trappers' Lake,	200	28	12
Trappers' Lake,	199	25	11
Trappers' Lake,	187	27	11
Trappers' Lake,	163	27	11
Trappers' Lake,	174	26	11

We have in Colorado clearly two races. Whether they should be deemed distinct species may be less certain. From the evidence at hand we should call them subspecies, in which event the new form should be called *Ochotona saxatilis figginsi* (Allen).

The chief point of interest in these two forms is that they

probably represent the definite results of the coming and going of the glaciers. Prior to the glacial epoch, if *Ochotona* existed at all in Colorado, the genus was likely confined to the highest mountains. During that epoch glaciers pushed down all the valleys from the higher mountains, and climatic conditions were favorable for the extension of the range of pikas southward and to lower altitudes, thus enabling them to span the low lands separating our mountain masses in the west and southwest. With the next change of climate which caused the retreat of glaciers, the lower limit of favorable habitat must have again risen, leaving the Pagoda Peak stock and many others in similar situations, stranded, isolated from the parental stock by the intervening unfavorable territory. The alpine and subalpine plants and animals of the isolated mountain masses of the West afford great opportunities for the study of the effect of isolation upon variation and the origin of new species.

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PROCEEDINGS

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TEN NEW MAMMALS FROM NEW MEXICO.

BY VERNON BAILEY,

U. S. Biological Survey.

In working out the ranges of mammals in New Mexico I find a number of forms that require specific or subspecific names. They include two chipmunks, three ground-squirrels, a jumping mouse, a cottonrat, a red-backed mouse, a cony and a shrew. The types are all in the Biological Survey collection in the U. S. National Museum.

Eutamias atristriatus sp. nov.

Type from the Sacramento Mountains, New Mexico, on Penasco Creek 12 miles east of Cloudcroft, alt. 7400 feet. No. 119,028, ♀ ad., U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, September 6, 1902. Original number, 7953.

General characters.—In size and general appearance nearest to *E. operarius* but slightly larger, duller and darker colored, and with longer, narrower skull.

Color.—In post-breeding or full summer pelage (Sept. 6 and 7), back with five broad black stripes, two rusty gray and two buffy-whitish stripes; sides duller and more grayish fulvous, and belly more yellowish than in *operarius*, *quadrivittatus* or *canipes* in the same pelage. Young of the year with the same excess of black above; sides dull and bellies yellowish as in adults.

Skull.—Longer and narrower than in *operarius*, smaller and relatively narrower than in *quadrivittatus*, much smaller than in *canipes*.

Measurements.—Type, ♀ ad.: Total length, 220; tail vertebrae, 114; hind foot, 32. Average of three adult topotypes, 210; 95; 32. *Skull* of type: greatest length, 33.8; basal length, 28.5; nasals, 9.6; greatest zygomatic breadth, 18; mastoid breadth, 16; width of braincase, 15; alveolar length of upper molar series, 5.

Specimens examined.—Ten, all from the east slope of the Sacramento Mountains, New Mexico, where Hollister and I collected them along

Penasco Creek at various points from 6 to 12 miles east of Cloudcroft and from 7000 to 8000 feet altitude, in the yellow pine zone. Four of these are adults, and six are young of the year, nearly full grown but still in immature pelage.

Remarks.—In cranial characters this chipmunk shows so little similarity to *E. operarius*, its apparently nearest relative, that I have given it full specific rank. A thorough revision of the genus may show some other species to which it is more nearly related, but its range is widely separated from that of any other small species and it occupies the same ground with the much larger *E. canipes*.

Eutamias cinereicollis cinereus subsp. nov.

Type from the Magdalena Mountains, New Mexico (alt. 8200 feet), in Copper Canyon. No. 167,029, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected by E. A. Goldman, September 1, 1909. Original number, 20,435.

General characters.—Similar to *cinereicollis* but much paler and grayer, the rufescent areas not only lighter colored but more restricted; crown, shoulders and rump clear ashy gray; white of belly clearer and more extensive; hind feet pale buffy; dorsal stripes, 3 black, 2 gray and 2 white, broad, clear and sharply defined.

Measurements of type, taken in the flesh by collector: Total length, 225; tail vertebrae, 91; hind foot, 33. Average of three other males from type locality, 224; 93; 33.6. *Skull* of type: Greatest length, 35.7; basal length, 30; nasals, 9.5; zygomatic breadth, 19.4; alveolar length of upper molar series, 5.6.

Specimens examined.—From the type locality, 5; from the San Mateo Mountains, 6.

Remarks.—Series of specimens of *cinereicollis* from the Mogollon and Mimbres Mts. show a slight tendency toward this pale gray form but are not sufficiently marked to be referred to it. From *canipes* on the east it differs more than from *cinereicollis* on the west, the feet being less gray and the general coloration far more grayish.

Callospermophilus lateralis arizonensis subsp. nov.

Type from San Francisco Mts., Arizona, No. $\frac{175227}{24163}$, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected August 8, 1889, by C. Hart Merriam and Vernon Bailey. Original number, 308.

General characters.—Larger and richer colored than *C. lateralis*, with under surface of tail of adults dull gray at all seasons.

Color.—In post-breeding or late summer pelage, upperparts brownish gray with broad black and buff stripe along each side; head and shoulders suffused with golden chestnut; rump and hams with deep chestnut shading to yellowish and to buffy on feet; belly buffy or soiled whitish. Winter pelage much duller and grayer, with but a trace of vinaceous chestnut over head and rump. Tail gray, scarcely lighter below than above. *Young.*—Similar to adults but often with 2 black stripes on each

side instead of one, and lower surface of tail pale chestnut at a certain age when nearly full grown, but never light yellowish as in the same stage of *lateralis*.

Skull.—Slightly larger than in *lateralis*, with wider bullae and heavier molars but generally lighter incisors.

Measurements.—Type: Total length, 292; tail vertebrae, 102; hind foot, 44. Average of 7 adult male topotypes, 282; 99; 42. Weight of type, 10 ounces. *Skull.*—Type: Greatest length, 45.4; basal length, 40.5; nasals, 16; zygomatic width, 28.5; mastoid width, 23; alveolar length of upper molar series, 8.5.

Remarks.—This really well-marked form has been long confused with *lateralis*, owing to the lack of specimens in comparable pelage. The present series in the Biological Survey Collection represent a large number of localities and covers practically every phase of pelage in both forms.

The type is taken from an Arizona locality, but the range of the subspecies extends throughout the Mogollon Mountains of New Mexico.

Citellus variegatus juglans subsp. nov.

WALNUT ROCK SQUIRREL.

Type from Glenwood, New Mexico, at 5000 feet altitude on the Rio San Francisco, at the southwest base of the Mogollon Mountains. No. 148,289, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, November 2, 1906. Original number 8587.

General characters.—In size and general external appearance closely resembling *C. variegatus* from southern Mexico, but not so dark and with a broader skull and smaller teeth.

Color.—Upperparts dark brownish gray with considerable blackish over head and ears, back coarsely variegated with irregular black tipped white crescents or wavy crossbars. Lowerparts varying from soiled whitish to rusty ochraceous; feet plain ochraceous.

Skull.—Low and wide as in *variegatus* but with smaller molars, broader jugals, and almost quadrate instead of falcate anterior base of zygoma. Braincase wider and relatively lower than in *grammurus*.

Measurements.—Type: Total length, 500; tail vertebrae, 230; hind foot, 65. Female from near type locality, 488; 215; 60. *Skull* of type: Greatest length, 61.4; basal length, 55; nasals, 22; zygomatic breadth, 38; mastoid breadth, 27.5; alveolar length of upper molar series, 12. Weight of type, 1½ lbs.

Remarks.—From *Citellus variegatus couchi* and *rupestris* this form differs in lighter dentition and in lack of the black cap. From *C. grammurus* it differs in low, wide skull and dark coloration.

Citellus tridecemlineatus hollisteri subsp. nov.

Type from the Sacramento Mountains, New Mexico (alt. 8000 feet), on the part of the Mescalero Indian Reservation known locally as Elk Valley. No. 119,025, ♀ ad., U. S. National Museum, Biological Survey

Collection. Collected by Vernon Bailey, September 11, 1902. Original number 7963.

General characters.—Smaller and darker colored than *C. pallidus*, larger and darker than *parvus*. In general appearance much like *alleni*, but with darker brown back and crown, and with light stripes of back more continuous.

Skull.—Short and wide as in *parvus* but decidedly larger and heavier. In size about as in *alleni* but with zygomatic arches much heavier and more spreading.

Measurements.—Type: Total length, 232; tail vertebrae, 70; hind foot, 32. *Skull* of type: Greatest length, 37; basal length, 31; nasals, 12.2; zygomatic breadth, 21.7; mastoid breadth, 17.3; alveolar length of upper molar series, 6.4.

Zapus luteus australis subsp. nov.

Type from Socorro, New Mexico. No. 160,731, ♀ young adult, U. S. National Museum, Biological Survey Collection, collected by E. A. Goldman, August 23, 1909. Original number 20,402.

General characters.—Small and slender, with very narrow skull. Colors pale.

Color.—Upperparts pale buffy yellowish sparingly lined with black hairs; back slightly darker but with poorly defined dorsal area; lowerparts pure white; heels dusky; feet white.

Skull.—Small, slender and very narrow, the braincase especially narrow and rostrum slender; dentition light.

Measurements of type, measured in field by collector: Total length, 205; tail vertebrae, 124; hind foot, 29.5. *Skull* of type: Total length, 21.4; basal length, 17.5; nasals, 8; zygomatic breadth, 10.7; mastoid breadth, 9.5; alveolar length of upper molar series, 3.2.

Sigmodon minimus goldmani subsp. nov.

Type from 7 miles north of Palomas, New Mexico (alt. 4200 feet). No. 167,625, ♀ young adult, U. S. National Museum, Biological Survey Collection. Collected October 28, 1909, by E. A. Goldman. Original number 20,695.

General characters.—Closely related to *S. minimus* and of about the same size, but darker and richer colored.

Color.—Upperparts coarsely grizzled with white, buff and black; ears and tail almost entirely black; feet very dark and belly dark rich fulvous.

Skull.—Very similar to that of *S. minimus*, but with longer and narrower andital bullae.

Measurements.—Type, measured in the field by collector: Total length, 256; tail vertebrae, 107; hind foot, 31. Young adult ♂ topotype, 238; 98; 31. *Skull* of type: Total length, 33; basal length, 29.5; nasals, 11.3; zygomatic breadth, 19.2; mastoid breadth, 15; alveolar length of upper molar series, 6.2.

Evotomys limitis sp. nov.

Type from the Mogollon Mountains, New Mexico (altitude 8500 feet), on Willow Creek, a branch of the Gilita. No. 148,335, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, October 27, 1906. Original No. 8572.

General characters.—Size slightly larger than *E. galei;* colors duller, grayer and less buffy; skull and dentition heavier.

Color.—*Winter pelage* with chestnut dorsal area less extensive than in *galei;* general color less yellowish and more mixed with gray; sides, face, and feet clear gray; belly whitish; tail bicolor; whitish below, dark gray above; pencil blackish.

Summer pelage: Much darker chestnut than *galei* with dark gray sides and face.

Skull.—Larger, heavier and conspicuously more ridged than in *galei;* bullae large and especially deep; dentition heavy throughout.

Measurements.—Type: total length, 162; tail vertebrae, 42; hind foot, 20. Average of four males from type locality: 142; 39.5; 20; of three females, 132; 35; 19.6. *Skull* of type: basal length, 24.5; nasals, 8; zygomatic breadth, 14.7; mastoid breadth, 12; alveolar length of upper molar series, 5.3.

Ochotona nigrescens sp. nov.

Type from the Jemez Mts., New Mexico (alt. 10,000 feet). No. 147,976, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, August 28, 1906. Original number, 8447.

General characters.—Size medium, colors very dark, with the brown heavily washed with black.

Color.—Upperparts in post breeding pelage, cinnamon brown, much darkened by the black tips of the long hairs. External surface of ear black, inner surface dark gray with a black band near tip. Throat and median part of belly rich cinnamon brown; top of feet soiled whitish, soles of hind feet blackish.

Skull.—Slightly smaller than that of *O. saxatilis* from Colorado, more arched, narrower, and with slenderer nasals and narrower prepalatal vacuity.

Measurements.—Type specimen, ♂ ad., measured in the flesh by collector: Total length, 200; hind foot, 30. The measurements of two topotypes, ♂ and ♀, were exactly the same. *Skull* of type: Total length, 43; basal length, 38; nasals, 14; zygomatic breadth, 21; mastoid breadth, 20.5; alveolar length of upper molar series, 8.

Specimens examined.—Three, all from the type locality.

Sorex obscurus neomexicanus subsp. nov.

Type from Cloudcroft, New Mexico (alt. 9000 feet), in the Sacramento Mountains. No. 100,440, ♂ ad., U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, May 29, 1900. Original number, 7383.

General characters.—Resembling *S. obscurus* but considerably larger and with slightly darker coloration.

Color.—Upperparts dull sepia brown with less reddish than in *obscurus;* lower parts with brownish suffusion quite strongly contrasted with the gray belly of *obscurus.*

Skull.—Conspicuously larger and heavier than in *obscurus* with relatively smaller third premolar.

Measurements.—Type: total length, 118; tail vertebrae, 45; hind foot, 15. Adult ♀ topotype: 106; 42; 14; another ♀: 115; 45; 14. *Skull* of type: greatest length, 18.4; basal length, 16.5; greatest width of braincase, 8.8; length of tooth row, 8; greatest width across molars, 5. Same measurements of an adult ♀: 18.5; 16.4; 8.5; 7.8; 5.

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PROCEEDINGS

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SIX NEW GROUND SQUIRRELS OF THE *CITELLUS MOLLIS* GROUP FROM IDAHO, OREGON, AND NEVADA.

BY C. HART MERRIAM.

An examination of the large series of Ground Squirrels of the *mollis* group in the collection of the U. S. Biological Survey indicates the existence of half a dozen apparently well marked forms which hitherto have escaped recognition. Unfortunately, most of the specimens were collected in late spring or early summer, so that the seasonal pelages can not be determined with certainty. In all the forms, however, there appear to be two color phases—gray, and buffy or buffy fulvous. The gray is commonest in adults, especially in early spring; the buffy in the young when first attaining the pelage of the adult, and in adults in early summer. Specimens in winter pelage, collected just before the animals den up in fall, and when they first come out in spring, are badly needed.

The new forms may be known from the following descriptions:

Citellus idahoensis sp. nov.

Type from Payette, at junction of Payette and Snake River, Idaho. No. 168,290 ♀ ad., U. S. Nat. Museum, Biol. Survey Coll. Collected April 23, 1910, by S. G. Jewett. Original No. 17.

Characters.—Largest of the *mollis* group. Similar in general to *mollis* but larger, with much stronger tendency to dappling, especially in young; tail longer, broader, and darker; eyelids white; anterior rim of ear usually white. Skull large and massive, with outstanding and outbowed zygomata.

Color.—*Gray pelage:* pale hoary grayish, faintly suffused with pale buffy and more or less dappled on back and rump; end of nose dull fulvous, contrasting strongly with grizzled gray of top of head; feet soiled whitish. *Buffy pelage:* very much darker throughout and strongly suf-

fused with pale buffy fulvous; dappling of back very distinct, in some cases amounting almost to spotting; dull fulvous of nose showing less contrast with top of head (which in this pelage is redder); tail much darker fulvous, almost ferruginous, with subapical black band broad and distinct; feet washed with buffy.

Young.—The young, when first assuming the adult pelage, are strongly dappled from behind the shoulders to base of tail. The pelages of the young may be known as *first* and *second*.

First coat.—Pelage long, silky, rather sparse, buffy-yellowish in color, soon (before the hairs of the second coat appear) becoming indistinctly dappled on the back.

Second coat.—The new coat comes in first on the head, a little later on hinder part of back (from middle of back to base of tail) leaving the neck and shoulders covered with the long silky hairs of the first pelage. This area (anterior half of back) is gradually covered by the second coat, mainly by the forward-creeping of the line of new hairs from the middle part of the back. The dappling is always pronounced and is strongest on the hinder part of the back, very rarely reaching so far forward as the shoulders.

The second pelage, which is attained when the animal is little more than half grown, resembles that of the adult. Its general tone may be either gray or buffy-fulvous, usually the latter. Of two young collected by Jewett at Mountain Home, Idaho, on the same day, May 25, 1911, one (No. 171,329) is gray; the other (No. 171,327) buffy-fulvous. But in our large series of young from several localities the gray pelage is rare.

Cranial characters.—Skull large, broad and massive, with prominent zygomata, large bullae, and heavy teeth. Compared with *mollis* (from type locality, Fairfield, Utah): Skull larger and more massive; rostrum and nasals longer; zygomata more spreading throughout; jugal much broader and more massive; maxillary roots of zygomata (viewed from in front) larger, broader, and more massive; anterior frontal region including orbital shelf of frontal, more elevated; upper (superior) face of premaxillary larger and usually reaching farther posteriorly; bullae larger; teeth heavier, the toothrow longer (8.5 mm.). Skulls of adults vary in the degree of bowing of the zygomata. The shorter skulls have the arches strongly outbowed; the longer ones have them much less prominent.

Measurements.—Average of 8 from type locality: Total length, 256; tail vertebrae, 62.5; hind foot, 35.5.

Remarks.—*Citellus idahoensis* inhabits the sagebrush plains of west-central Idaho north of Snake River. The Biological Survey has large series of specimens, collected mainly by S. G. Jewett, from Payette, Nampa, Kuna, Orchard, and Mountain Home.

Citellus leurodon sp. nov.

Type from Murphy, in hills of southwestern Idaho west of Snake River. No. 169,031 male young-adult, U. S. Nat. Museum, Biol. Survey Collection. Collected May 30, 1910, by S. G. Jewett. Original No. 112.

Characters.—Size rather large, about equaling *idahoensis* from the

opposite side of Snake River, but with shorter tail. Color gray, not dappled except in the young. Teeth very large, equaling maximum of *idahoensis* (upper molariform series 8.5 mm.).

Cranial characters.—Skull of medium size (larger than *mollis* and *canus;* slightly smaller than *idahoensis*), strongly built but slightly less massive than *idahoensis;* zygomata not spreading and not bowed outward; teeth large, broad and rounded—the toothrow equaling the largest *idahoensis* (longer than *mollis* and therefore much longer than *canus*).

The skull and teeth agree most closely with *idahoensis* from Payette, Idaho, but the skull is smaller and the zygomata are less spreading.

Measurements.—Type specimen (not fully adult): Total length, 233; tail, 47; hind foot, 33.

Citellus canus vigilis subsp. nov.

Type from Vale, eastern Oregon. No. 168,361, female adult, U. S. Nat. Museum, Biol. Survey Coll. Collected April 29, 1910, by S. G. Jewett. Original No. 30.

Characters.—Similar in general to *canus;* color iron-gray, finely lined, much as in *canus*, but more hoary-whitish. Skull large and massive, much larger and heavier than *canus*—in fact decidedly larger than *mollis* and not materially smaller than *idahoensis;* zygomata broad and outbowed, much as in *idahoensis; bullae* large, as in *mollis*—decidedly larger than in *canus;* rostrum and nasals longer than in *canus;* toothrow (7.25–7.75) decidedly longer than in *canus* but shorter than in *mollis* and *idahoensis.*

Compared with *idahoensis* from the opposite (eastern) side of Snake River, *vigilis* is easily distinguished externally by the absence of dappling on the back and by shorter and paler tail; and cranially, by smaller bullae and shorter toothrow.

Measurements.—Average of 8 adults from type locality (Vale, Oregon): Total length, 207; tail vertebrae, 36; hind foot, 30.5. (Type specimen: 208, 33, 32.)

Remarks.—Specimens from Paradise Valley, northeastern Nevada, appear to be the same as those from Vale and Huntington, Oregon.

Citellus mollis artemesiae subsp. nov.

Type from Birch Creek, Idaho. No. $\frac{23458}{30907}$, male adult, U. S. Nat. Museum, Biol. Survey Coll. Collected August 9, 1890, by Vernon Bailey. Original No. 1573.

Range.—Sagebrush plains of southeastern Idaho (north of the range of *mollis;* east of the range of *idahoensis*).

Characters.—Smallest of the known forms of the *mollis* group. Similar in general to *mollis*, but tail grayer, with less buffy fulvous; *bullae and teeth much smaller.*

Cranial characters.—Skull small, smaller and shorter than in *mollis;* rostrum rather short and slender; zygomata moderately bowed; *bullae small*—as small as in *canus;* molariform teeth decidedly smaller than in *mollis* (slightly larger than in *canus*). Compared with typical *mollis*, the rostrum is shorter, the zygomata more bowed, the bullae *much*

smaller. Skull very like that of *canus* but zygomata less outstanding anteriorly, braincase slightly less broad posteriorly, and toothrow a little longer; bullae of same size.

Measurements.—Average of 6 specimens from type locality (Birch Creek, Idaho): Total length, 182; tail, 37; hind foot, 29.5. Average of 5 from Blackfoot: 201, 43.5, 32.

Citellus mollus pessimus subsp. nov.

Type from lower part of Big Lost River, east central Idaho. No. $\frac{23925}{31330}$ male adult, U. S. Nat. Museum, Biol. Survey Coll. Collected July 23, 1890, by C. P. Streator. Original No. 53.

Characters.—Similar to *artemesiae* (from Birch Creek) but somewhat larger and darker; tail longer, larger, and darker; rostrum larger.

Cranial characters.—Skull small like that of *artemesiae* but longer; *rostrum and nasals longer and broader;* toothrow longer. Compared with *mollis*, skull smaller; bullae and teeth decidedly smaller.

Measurements.—Average of 8 from type locality: Total length, 205; tail vertebrae, 46; hind foot, 33.

Citellus mollis washoensis subsp. nov.

Type from Carson Valley, western Nevada. Type No. $\frac{16246}{23861}$, adult, U. S. Nat. Museum, Biol. Survey Coll. Collected May 23, 1889, by Charles A. Keeler. Original No. 34.

Characters.—Size large; coloration grizzled gray throughout, resembling *canus*. Skull large, long, and massive—nearly as large as that of *idahoensis* from Payette, Idaho, but narrower, with more slender rostrum, much more slender premaxillae, and shorter toothrow. Similar to *mollis*, but more massive; rostrum and palate longer. Compared with largest skulls of *canus*, the rostrum is much longer and more slender; superior surface of premaxillae much slenderer; palate much longer; bullae somewhat larger; toothrow decidedly longer.

Measurements of type specimen: Total length, 258; tail vertebrae, 50; hind foot, 35.

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PROCEEDINGS

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DESCRIPTION OF A NEW WEASEL FROM ALABAMA.

BY ARTHUR H. HOWELL.

Weasels are exceedingly scarce and very difficult to obtain in the Southern States. Within the past year three specimens, representing both winter and summer pelage, have been received from Alabama by the Biological Survey, and these seem to represent an undescribed subspecies, closely related to *Mustela peninsulae* (Rhoads).

The acquisition of this material is due to the energy of Mr. Lewis S. Golsan of Autaugaville, and Mr. Bennington King of Leighton, who, at my suggestion, made special efforts to obtain specimens of the Alabama Weasel.

The new race may be characterized as follows:

Mustela peninsulae olivacea subsp. nov.

Type from Autaugaville, Ala. ♂ ad. No. 180,802, U. S. National Museum, Biological Survey Collection. December 22, 1912. Collected by L. S. Golsan. Original No. 144 (9988x).

Characters.—Similar to *M. peninsulae*, but color in winter pelage decidedly paler and more olivaceous; yellowish of feet less extensive.

Color.—Type (winter pelage): upperparts nearest to buffy-brown (of Ridgway); head slightly darker, about Natal brown; a small patch of white on each side of face behind the eyes, and a few flecks of white on top of nose; color of upperparts covering about half of front feet, the remainder, including toes, being cream-buff; toes of hind feet tinged with whitish; black tail tip about 70 mm. in length; underparts straw-color, irregularly blotched with cartridge-buff.

Summer pelage.—(Specimens from Leighton, Alabama): upperparts mummy-brown; head Vandyke brown with a few white flecks between the eyes; underparts cartridge-buff to colonial buff; color of upperparts encroaching on the belly; toes of front feet cream color; those of hind feet tinged with whitish.

Skull.—Similar to that of *peninsulae*, with broad braincase, widely spreading zygomata, large post-orbital processes, broad and much inflated audital bullae, broad inter-pterygoid fossa and heavy molars. The bullae are of essentially the same shape as those of *peninsulae* but are not quite so high.

Measurements.—Type (♂ ad.): total length, 420; tail vertebrae, 140; hind foot, 50. Skull: occipito-nasal length, 48; basilar length, 46.8; palatal length, 21.6; mastoid breadth, 25.3; zygomatic breadth, 29.3; breadth across post-orbital processes, 14; least interorbital breadth, 9; audital bullae, 15 x 7.6; width of inter-pterygoid fossa, 3.5.

Remarks.—On account of the scarcity in collections of *Mustela peninsulae peninsulae*, the range of color variation in that race is not known. The two winter specimens before me, however, differ widely, the palest one (No. 9379, Coll. Acad. Nat. Sci. Phila., Tarpon Springs, Florida) being about Verona-brown (of Ridgway), the other a much darker shade of brown. Both are darker and browner than the type of *olivacea*. The summer pelage of *peninsulae* is not definitely known, but a worn specimen from Hernando Co., Florida, is decidedly lighter than the specimens of *olivacea* from Leighton. The latter do not differ much in color of the upperparts from certain specimens of *noveboracensis*, but the underparts are a duller shade of yellow.

This weasel may be instantly recognized as distinct from *Mustela noveboracensis* by its striking skull characters. The latter species ranges down the Alleghenies to northern Alabama, as evidenced by a typical specimen which I collected on Lookout Mountain near Fort Payne, in July, 1911.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A REVISION OF THE CRINOID FAMILY MARIAMETRIDÆ.

BY AUSTIN HOBART CLARK.

At the present time the endocyclic comatulids possessing more than ten arms in which all the division series consist of two ossicles, the outer cirrus segments bear single median dorsal processes, and the enlarged proximal pinnules are flagellate, at least distally, are distributed among the genera *Pontiometra* (included in the family Pontiometridæ), *Oxymetra* (of which the genus *Selenemetra* is a synonym), *Mariametra* and *Dichrometra* (included in the family Mariametridæ). In addition to the genus *Pontiometra* the family Pontiometridæ contains only the highly aberrant genus *Epimetra*.

The family Pontiometridæ was originally differentiated from the family Mariametridæ on the ground of certain striking morphological peculiarities which I am now led to believe are of purely secondary systematic importance.

At the time of its description the genus *Epimetra* was provisionally associated with *Pontiometra* in the family Pontiometridæ on account of the strong general resemblance of the two types. A closer study of this genus indicates that it should properly be referred to the family Colobometridæ and placed near the genus *Cyllometra*, the grounds upon which this disposition is suggested being (1) the deficient pinnulation, (2) the lateral broadening of the dorsal processes on the outermost cirrus segments (including the broadly bifurcate opposing spine), and (3) the close correspondence of the details of the arm structure.

Of the genera *Pontiometra*, *Oxymetra*, *Mariametra* and *Dichrometra*, which together form a perfectly natural family, the

family Mariametridæ, the first three are homogeneous and satisfactory units, but the last is quite heterogeneous and far from satisfactory, having been used, in fact, to include all such forms as are referable to the Mariametridæ but which do not fall within the scope of the others.

It is possible by the division of the genus *Dichrometra* as now understood into three natural sections to so rearrange the various species that they will fall into groups which will be found to be strictly comparable to the other genera in the family Mariametridæ, and to the genera in the most nearly related families.

The lines along which the generic divisions within the family Mariametridæ would then fall are indicated by the following key:

KEY TO THE GENERA OF MARIAMETRIDÆ.

a^1 Cirri very large and long, with more than 40 (usually 50–80) segments

b^1 P_1 on the outer arms greatly elongated and flagellate, more than five times as long as the following pinnules; division series very narrow, very deep dorsoventrally, and very widely separated

(1) *Pontiometra*

b^2 P_1 only very slightly, if at all, longer than P_2, and of the same character; division series nearly or quite in apposition laterally through the extension of their ventrolateral borders

(2) *Oxymetra*

a^2 cirri short or of moderate length, with less than 40 segments

b^1 P_2 and P_3 similar, and of equal length

(3) *Liparometra* (nov.)

b^2 P_2 and P_3 of unequal length

c^1 P_2 markedly longer, and more or less stouter, than P_3 or P_1

(4) *Lamprometra* (nov.)

c^2 P_3 markedly longer than P_2, which in turn is markedly longer than P_1

d^1 lateral portions of the dorsal surface of the division series perfectly smooth; division series never carinate, and never with a narrow dark median line; disk naked

(5) *Dichrometra*

d^2 lateral portions of the dorsal surface of the division series with a prominent granular, tubercular or spinous ornamentation; a faint median carination or a narrow dark median line on the division series and arm bases, often both occurring together; disk completely covered with calcareous plates

(6) *Mariametra*

The genera which collectively form the family Mariametridæ, with the original references, the genotypes, the geographical and bathymetrical ranges, and the named species included in them, are the following:

1. **Pontiometra** A. H. Clark.

Pontiometra 1907. A. H. Clark, Smiths. Miscell. Coll. (Quarterly Issue), Vol. 50, p. 354.

Genotype.—*Antedon andersoni* P. H. Carpenter, 1889.

Range.—From the Mergui Archipelago and the Andaman Islands eastward to the Moluccas, New Caledonia, the Pelew Islands and the Philippines.

Depth.—0–24 fathoms.

Nominal Species included in the Genus.—*Andersoni*, *insperatus* and *polypus*.

2. **Oxymetra** A. H. Clark.

Oxymetra 1909. A. H. Clark, Proc. Biol. Soc. Wash., Vol. 22, p. 13.

Genotype.—*Antedon crinacea* Hartlaub, 1890.

Range.—From the Andaman Islands eastward to New Britain and the Philippine Islands.

Depth.—0–42 fathoms.

Nominal Species included in the Genus.—*Aranea*, *crinacea*, *finschii*, *gracilipes*, *tenuicirra* and *viridis*.

3. **Liparometra** gen. nov.

Diagnosis.—A genus of Mariametridæ in which the cirri are of moderate length and consist of less than 40 segments, and P_2 and P_3 are of equal length, longer than P_1 and P_4, rather slender, and flagellate.

Genotype.—*Himerometra grandis* A. H. Clark, 1908.

Range.—From Queensland and the Moluccas to the Tonga Islands, and northward to southwestern Japan.

Depth.—0–40 fathoms.

Nominal Species included in the Genus.—*Articulata*, *grandis* and *regalis*.

4. **Lamprometra** gen. nov.

Diagnosis.—A genus of Mariametridæ in which the cirri are of moderate length or short, composed of less than 40 segments, with the outer segments furnished with a median dorsal keel or slight dorsal tubercles, and P_2 is markedly longer and stouter than P_3, and also longer and stouter than P_1.

Genotype.—*Antedon imparipinna* P. H. Carpenter, 1882.

Range.—From the Red Sea eastward to and throughout the East Indies, reaching Australia, New Caledonia, the Solomon Islands, Samoa, Tonga, Fiji, the Philippine Islands, the Marshall Islands, the Caroline Islands, the Hawaiian Islands and Hong Kong.

Depth.—0–20 (?36) fathoms.

Nominal Species included in the Genus.—Æquipinna, amboinensis, brevicuneata, conjungens, dividua, gyges, heliaster, imparipinna, klunzingeri, laevicirra, lepida, leucomelas, occulta, okelli, palmata, polyactinis, protectus, regina, scita, similis, subtilis and *tenera.*

5. **Dichrometra** A. H. Clark.

Dichrometra 1909. A. H. Clark, Proc. Biol. Soc. Wash., Vol. 22, p. 12.

Genotype.—Alecto flagellata J. Müller, 1841.

Range.—Southeastern Africa and the Bay of Bengal to the Sunda Islands, the Moluccas, New Guinea and the Pelew Islands, and northward to southern Japan.

Depth.—0–84 fathoms.

Nominal Species included in the Genus.—Afra, bimaculata, ciliata, döderleini, elongata, flagellata, pulcher, stylifer and *tenuicirra.*

6. **Mariametra** A. H. Clark.

Mariametra 1909. A. H. Clark, Proc. Biol. Soc. Wash., Vol. 22, p. 144.

Genotype.—Himerometra subcarinata A. H. Clark, 1908.

Range.—From Great West Torres Island to Timor, the Macclesfield Bank and southern Japan.

Depth.—22–84 fathoms.

Nominal Species included in the Genus.—Delicatissima, margaritifera, subcarinata, tenuipes, tuberculata and *vicaria.*

Family MARIAMETRIDÆ A. H. Clark.

Mariametrinæ 1909. A. H. Clark, Proc. Biol. Soc. Wash., Vol. 22, p. 176.

Range.—Indian and western Pacific Oceans; east Africa from Madagascar and Zanzibar to Suez, and eastward, including the southern coast of Asia and the northern coast of Australia, and the shores of all the intervening islands, to New Caledonia, Fiji, Tonga, Samoa, the Hawaiian, Marshall, Caroline and Pelew Islands, and southern Japan.

Depth.—Littoral and sublittoral, ranging from the low tide mark (and occasionally tide pools) down to 42 fathoms, and to 84 fathoms in southern Japan.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

REPTILES AND AMPHIBIANS FROM EASTERN SUDAN.

BY T. BARBOUR.

During the past winter (1912–1913) Dr. John C. Phillips of Harvard University conducted an expedition into the Sudanese Province of Sennaar for the purpose of collecting zoölogical specimens, principally mammals and birds, for the Museum of Comparative Zoölogy. He was accompanied by Dr. Glover M. Allen. The small collection of reptiles and amphibians obtained is here reported upon. Both Dr. Phillips and Dr. Allen were disappointed in the number of individuals and species obtained in these groups and remark that they were extremely rare. The probable reason for their scarceness was the fact that the region had suffered severely from a prolonged drought and from many brush and grass fires which had evidently seriously impoverished the entire fauna. Only one new species was obtained by the expedition but the small amount of material in American museums representing the fauna of this region makes it desirable to place all the specimens and the localities whence they came upon record.

REPTILIA.

Sauria.

Tarentola annularis (Geoffroy).

Three enormous specimens of this species were procured at Magangani, from the hollow interior of a large baobab tree.

Lygodactylus picturatus gutturalis (Bocage).

The expedition has returned with a considerable series of these small Gekkos, which they found in the cracks of the bark of various forest trees. Specimens were caught at El Mesherat, Abu Zor, and 15 miles above Roseires, on the Blue Nile. These specimens are evidently referable to *gutturalis*, which is distinguished from the true *picturatus* by

having chevron-shaped black markings in the gular region of the males instead of having a throat which is wholly black, as in the other race. Since specimens in the Museum from Zanzibar and the Guaso Nyiro district in British East Africa show a perfectly transitional condition so far as the color of their throats is concerned, it seems best not to consider the two races distinct species, but to follow Werner (l. c., p. 1838) in using a trinomial for the Sudanese specimens. The other characters separating the species are not apparently very important, and probably vary. Unfortunately I have no specimens of *L. capensis* to study in connection with these specimens.

Agama spinosa Gray.

Dr. Phillips and Dr. Allen met with this species commonly throughout their journey, and it was apparently the only member of the genus that they procured. The series preserved consists of 6 specimens from Singa, 4 specimens from Gabbardi, and 8 specimens from Fazogli. These specimens are, for the most part, of small size, the largest specimen being but 200 mm. long, though part of the tail is lacking. Owing to the coloration of many of the individuals, which very frequently is like that described by Boulenger for *A. hartmanni* Peters (Cat. Liz. Brit. Mus., I, 1885, p. 340), I supposed at first sight that I had to do with this species. All the examples before me, however, have the enlarged occipital, and otherwise agree with the description of this species as given by Boulenger (l. c., p. 355).

Werner has contributed recently a long discussion regarding the status of *A. hartmanni* Peters in relation to *A. doriae* Boulenger and *A. colonorum* Daudin. From what he writes, it is somewhat difficult to gather whether he considers these species all distinct or all to be included in *A. colonorum*. I find it almost impossible to determine the impression he wishes to convey; for in his paper of 1907, on the reptiles and amphibians that he himself collected in the Egyptian Sudan and northern Uganda (Sitz. Ak. d. Wissens. Wien, 116, i, 1907, p. 1837) he says: "Ich kann dennach der *A. doriae* keinerlei spezifische Selbstandigkeit zusprechen und muss sie mit *A. colonorum* vereinigen." On the previous page, however, speaking of the type of *A. hartmanni*, which he examined in Berlin, he says: "Das Exemplar hat entschieden nicht den Habitus der Agamen aus der *spinosa-colonorum* Gruppe, sondern mehr den der deserticolen Gruppe I bei Boulenger." But a few lines further on he says again: "Ist aber *A. hartmanni* mit *A. doriae* identisch, so ist dasselbe zicherlich auch mit *A. doriae* und *colonorum* der Fall, und zwar sprechen dafur sowohl morphologische als geographischer Gründe," while on the following page he names all three separately in his faunistic lists of species. The material which I have at hand is not sufficient to settle this question, which I imagine is still an open one.

Latastia longicaudata (Reuss).

A single specimen, almost adult, found at Singa, the present capital of the Province of Sennaar. This specimen is much more brilliantly colored

than others which were brought back from British East Africa by the Smith Allen and Brooks, and the Frick expeditions, which were accompanied respectively by Dr. Allen and Mr. W. R. Zappey. These specimens are pale brown with lighter lines and had bluish or mauve marblings or ocelli upon the sides between distinct vertical black bars. The specimen from Singa is dark brown, with fine longitudinal light lines upon the back, a series of white spots along the sides with black interspaces, forming irregularly vertical bars, and with bluish spots on a black band above the series of white spots. The legs are dark, almost black, marbled with bluish. In all characters of squamation, however, the individuals seem to be entirely indistinguishable; and with only a single Sudanese specimen, it is quite impossible to say whether a local color variety exists in the region. There can be no doubt but that the coloration is sufficient to characterize one were it found to be constant.

Chalcides ocellatus Forskal.

A single beautifully colored adult, caught at Bados.

Mabuya quinquetaeniata (Lichtenstein).

This wide-ranging and common species was found at almost all localities visited, and typical examples of both young and adults were secured. The brilliant blue tail of the young is very striking, recalling that of certain American species of Eumeces and East Indian species of what may be called for convenience Lygosoma. This blue tail-color is probably an ancient ancestral character, since it can certainly have no protective or other value to the young which it would not have equally for the adult. It is probably comparable in a way to the breast spotting seen in the young of various thrushes not very closely related to each other, and to other similar astonishingly well-fixed color characters which are so different from those one is accustomed to find among species of reptiles especially. Frequently the variability of coloration in some familiar species is inclined to lead one away from realizing what a fundamental phylogenetic significance some color characters have even in reptiles.

RHIPTOGLOSSA.

Chamaeleo basiliscus Cope.

This species was found only once, when, at Magangani, a single specimen was procured. This specimen, which is an adult, I have compared carefully with the type of *basiliscus*, M. C. Z. No. 5766 from Nubia. I find that they agree in every particular.

SERPENTES.

Zamenis florulentus (Geoffroy).

A single example from Gebel Okalma. It is slightly atypical in having 23 instead of 21 rows of scales. Boulenger states that this is a rare condition.

Psammophis sibilans (Linne).

One specimen from Um Orug; one from Magangani; and a third from Fazogli. These three examples differ considerably from one another in coloration, and, with other specimens in the Museum, show that there is apparently no relationship whatever between type of coloration and distribution. The various color patterns seem to occur indiscriminately throughout the entire range of the species.

Atractaspis phillipsi sp. nov.

Type.—A single young specimen, Mus. Comp. Zool. No. 8782, from Singa, Province of Sennaar, eastern Anglo-Egyptian Sudan, collected by Dr. J. C. Phillips and Dr. G. M. Allen, February, 1913.

This species belongs in that section of the genus which has the anal as well as the subcaudals all entire, the postocular in contact with a large temporal, the fourth lower labial largest and the first lower labial in contact with its fellow behind the symphysial.

Snout rounded; portion of rostral visible from above, considerably shorter than its distance from the frontal; suture between the internasals rather shorter than that between the praefrontals; frontal slightly longer than broad, longer than its distance from the end of the snout, as long as the parietals; one prae- and one post-ocular; a large temporal wedged down between the fourth and fifth upper labials, which are six in number, the fourth alone entering the orbit, the fourth also the largest scale in the series; first lower labial in contact with its fellow behind the symphysial; three lower labials in contact with the chin-shields, the fourth lower labial the largest. Scales in 31 rows. Ventrals 232; anal entire; subcaudals 24, all single. Body solid black above, head very dark iron gray; belly deep plum color, almost black; vent white. Length, 290 mm.; tail, 22 mm.

Remarks.—I am unable to find any record for this genus nearer than Ogaden, Somaliland, the type locality of *A. leucomelas* Blgr., or Wadelai, whence there are specimens in the British Museum of both *A. irregularis* (Reinh.) and *A. atterima* Jan. Dr. Franz Werner (Sitzb. d. ak. Wissens., Wien, 116, i, 1907, p. 1823–1926, pl. 1–4), in the report upon the reptiles and amphibians which he collected on his journey to the Egyptian Sudan and northern Uganda, has brought together the various records for this region, bringing the list down to 1907. His only mention of the occurrence of this genus in the Sudan is in reference to the two specimens from Wadelai, which were collected by Emin Pacha, and which are now in the British Museum. Dr. Phillips's discovery of this genus in the province of Sennaar extends greatly its known range, and adds an important tropical genus to the fauna as we have known it heretofore. It is altogether proper that this species should bear his name.

Since this was written I have received Werner's revision of the entire genus and can not find that anything very closely related to this form is now known. (Werner, Mit. Naturh. Mus. Hamburg, 30, 1913, pp. 31–39.)

AMPHIBIA.

Rana mascareniensis Duméril & Bibron.

Three specimens from Gizeh, Egypt, fall into this species as it is restricted by Werner (l. c. p. 1889).

Phrynobatrachus natalensis (Smith).

Seven examples from a pool in the dried up Dinder River, at Abiad. The series shows the usual variation in color, some having and others lacking the conspicuous vertebral stripe.

Bufo regularis Reuss.

The expedition secured a number of young toads, apparently referable to this species, at Luxor, Egypt.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ON TWO NEW CHARACINS IN THE AMERICAN MUSEUM.

BY JOHN TREADWELL NICHOLS.

Of the numerous exotic fishes donated from time to time to the Natural History Museum in New York, the following seem not to have been described:

Cœlurichthys lateralis sp. nov.

The type No. 4072, American Museum of Natural History, is 30 mm. long to base of caudal; depth, 3.5 in this measure; head, 3.9; eye, 2.7 in head; snout, 5.0; end of maxillary from tip of snout, 2.5. Moderately elongate and compressed, the dorsal and ventral outlines similar posteriorly, the dorsal straighter, more horizontal, anteriorly. Lower jaw projecting, maxillary vertical, to front of pupil. Snout very short; eye large; nostrils separated by only a narrow partition. Several large pores on side of head above. Dorsal origin equidistant from base of central caudal rays and posterior margin of gill-cover. Its height contained about once and a half in head. A small adipose present. Anal long, its origin distinctly in advance of that of dorsal. Ventrals to anal. Pectorals past base of ventrals. Caudal forked, the lower lobe pointed (the upper lobe broken). Dorsal, 9; anal, 31. Scales, 40; about 15 lengthwise series. Lateral line incomplete, short, on about 6 scales. Our only other specimen, No. 4086, has the fins much broken, but in some other ways is better preserved than the type. It has cusped teeth in the upper jaw, which seem to be arranged in two imperfect series, a few larger central ones set further back than the others. About five small ones are situated beyond the premaxillary-maxillary angle. Inside these five are about five minute, more widely spaced teeth. The lower jaw has a single series of cusped teeth. The opercle has a rather broad membranous margin. Gill membranes separate and free. A broad dusky lengthwise band on the lower part of the side; a narrow streak above it in the center of the peduncle. Central caudal rays more or less dusky; tip of lower jaw dusky.

These two small aquarium fishes were presented to the American Museum of Natural History by Mr. William Mack, of New York. There was no accompanying data, but they are probably South American, and are referred to the genus *Cœlurichthys* of Ribeiro.*

Cœlurichthys tenuis sp. nov.

The type No. 4087, American Museum of Natural History, is a specimen 31 mm. long to base of caudal; depth, 4.0 in this measure; head, 4.1; eye, 3.0 in head; snout, 4.0; end of maxillary from tip of snout, 2.3. Elongate and compressed, the dorsal outline almost straight; the ventral outline arched downward in front and slanting gently upward behind. Lower jaw projecting. Maxillary vertical, to front of pupil. Snout short. Nostrils separated by only a narrow partition. Pores on side of head above. Dorsal origin equidistant from base of central caudal rays and posterior margin of gill-cover. Its height only slightly less than the length of head. When depressed, the dorsal overlaps the front of the adipose fin. Anal long, its origin distinctly in advance of that of the dorsal. Ventrals to anal. Pectorals past base of ventrals. Caudal broad; this fin is broken but was certainly forked, perhaps with a rounded lower lobe. A peculiar scaly, downward opening, pocket structure on the base of the middle caudal rays. Dorsal 9, anal 32. Scales 40, about 13 lengthwise series. Lateral line incomplete, short, on about 7 scales. Lower jaw with a single row of cusped teeth in front, changing abruptly to minute teeth on the side. Upper jaw with what apparently is a single row of cusped teeth, about 3 small teeth at the side beyond the premaxillary-maxillary angle. Gill membranes separate and free. A broad dusky, lengthwise band on the lower part of the side, a narrow central streak above it posteriorly. Central caudal rays and tip of lower jaw more or less dusky.

Our only other specimen, American Museum of Natural History No. 4088, 32 mm. long., has 31 anal rays and apparently an imperfect inner row of teeth in the front of the upper jaw; otherwise resembles the type.

These two small Aquarium fishes were presented to the American Museum of Natural History by the New York Aquarium Society. There was no accompanying data. They are close to *Cœlurichthys lateralis*.

The two species here described may be separated from *C. iporangæ* as follows:

Depressed dorsal not reaching adipose. Lower caudal lobe pointed. Depth 3.5 . . . . . *lateralis*

Depressed dorsal reaching adipose.

Depth 3.5 . . . . . *iporangæ*

Depth 4.0 . . . . . *tenuis*

* Rio de Janeiro, Kosmos, V, No. 2. February, 1908.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE BAHAMA BARN OWL.

BY J. H. RILEY.

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When writing the bird report on the birds collected upon the Geographic Society of Baltimore's expedition to the Bahamas, I prepared some remarks upon a specimen of the Barn Owl shot at Nassau, but when copying my paper to send to The Auk,* through an unaccountable oversight they were entirely omitted. Mr. Ridgway with the addition of two Bahaman specimens in the collection of Outram Bangs, kindly loaned him for study, has called my attention to the fact that the Bahaman bird differs from that of the eastern United States and has kindly permitted me to describe it. It may be known as:

Tyto perlatus lucayanus subsp. nov.

Type, U. S. National Museum, No. 189,671, adult male, New Providence, Bahamas, June 30, 1903. Collected by J. H. Riley (original No. 50).

Subspecific characters.—Similar to *Tyto perlatus pratincola*, but with less amount of the grayish black-vermiculated tipped feathers of the upper parts.

Description.—Top of head, neck, and upper back tawny ochraceous with a few blackish spots or mottlings and some minute grayish white spots along the shaft of the feathers; feathers of the interscapular region, grayish basally, tawny ochraceous subterminally with irregular black mottlings, and grayish terminally with black vermiculations and with a white shaft spot near the tip; rump and upper-tail coverts tawny ochraceous with a few black markings and minute white spots along the shaft; bend of wing tawny ochraceous with black markings and small white spots along the shaft; rest of wing-coverts largely tawny ochraceous, with black spots, some of the feathers grayish terminally with black vermiculations and a white shaft spot near the tip, the primary

* XXII, 1905, pp. 349–360.

coverts deepening into rather deep tawny externally with black mottlings along the outer web and tip and a whitish shaft spot terminally and with indications of interrupted black bars along the shaft; flight feathers ochraceous-buff on the outer web and along the shaft, white internally, the ochraceous-buff deeper on the primaries and lighter on the secondaries, with minute black fleckings on the outer web and tip, and with interrupted black bars along the shaft; under wing-coverts white with a few small black spots; tail ochraceous-buff with irregular black bars and black fleckings towards the tip, the inner webs of all the tail feathers, except the middle pair, mostly white, the outer feathers entirely white without bars, the two distally only indicated by small black spots along the shaft and with a few obscure fleckings near the tip; face white, with a slight vinaceous tinge, this latter color deepening into liver brown just above the eye, forming a prominent mark; the feathers of the ruff white tipped with tawny or tawny ochraceous and from just forwards of the eye around under the chin terminally edged with black; the lower jugulum, breast, and sides ochraceous-buff, with minute black dots which also extend upon the upper abdomen; remaining underparts white; thighs light ochraceous-buff externally, white internally. Wing, 324; tail, 135; culmen from cere, 22; tarsus, 74; middle toe, 40 mm.

Remarks.—The type differs from the other Bahaman specimens before me in being much deeper colored above, the ochraceous-buff on the breast, and in some other particulars, which on account of the great variation in birds of this genus are not worth mentioning. From *Tyto perlatus pratincola* the Bahaman bird does not seem to differ much in size. The average in millimetres of a small series is given below:

Males.	Wing.	Tail.	Culmen.
Five from eastern United States	338.4	143.8	22.3
Two from the Bahamas	326.5	133.7	22
Females.			
Five from the eastern United States . . .	343.4	146.4	23.2
Two from the Bahamas	354	144	23.2

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PROCEEDINGS

OF THE

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A NEW BOT-FLY FROM REINDEER.

[DIPTERA; MUSCOIDEA.]

BY FREDERICK KNAB.

Bureau of Entomology.

A bot-fly of reindeer, whose larvæ inhabit tumors under the skin, has been long known. The species is now designated as *Œdemagena tarandi* (L.). Since 1736, when Linné first described it from Lapland,* the fly has been frequently reported from northern localities of the Old World, and a number of times from the boreal regions of North America.† Specimens before me from Alaska agree with those from the Old World, so that there can be no doubt that the species is circumpolar. *Œdemagena tarandi* may be said to be very well known and has until now stood alone in its genus. The discovery of a second species of the genus, also from reindeer, is therefore rather surprising. The new species is evidently confined to Newfoundland, where it infests the reindeer peculiar to that island (*Rangifer terrænovæ* Bangs).

Œdemagena terrænovæ sp. nov.

Female.—Black, body vestiture entirely of dull greenish yellow hair; legs black, the middle and hind tibiæ and tarsi partly ferruginous.

Head narrower than the thorax; frons clothed with rather short, stiff black hair, the nape and cheeks with long silky yellowish hair; ridge between the antennæ black, shining; antennæ black, the third joint shining, the arista short and thick; face below the antennæ clothed with long yellowish hair. Mesonotum black, clothed before the suture with dense erect yellowish hair, behind it with black hair; extreme posterior margin

* Linné, Flora lapponica 173[illegible], pp. 36[illegible], 379.

† See bibliographies in: Brauer, Mon. d. Œstriden, 1863, p. 131; Bezzi & Stein, Kat. d. palæarkt. Dipt., Vol. 3, 1907, p. 585.

with yellowish hair, a tuft of paler yellowish hair at posterior angles. Scutellum black, clothed with erect yellowish hair. Pleuræ and coxæ clothed entirely with dense, long, pale yellowish hair. Abdomen elongate ovate, about as wide as the thorax, tapered beyond the fourth segment to the very slender retractile ovipositor; vestiture entirely of dense, erect yellowish pile. Legs black, the tibiæ and tarsi partly ferruginous; pulvilli uniformly pale smoky brown. Front legs entirely black, the femora with long yellowish pile on postero-dorsal and postero-ventral surfaces nearly to apex, the remainder, as well as the tibiæ with shorter black hairs. Middle legs with the apical half of the tibia dark ferruginous; first two tarsal joints ferruginous, dark at apices, the remaining joints nearly black; vestiture long and pale yellowish on postero-ventral surface of femur nearly to apex and on postero-dorsal surface of tibia excepting basal fourth, all the remaining vestiture black. Hind legs with the apical two-thirds of tibia ferruginous, the extreme tip marked with black; first to third tarsal joints ferruginous, black at apices, last two joints velvet black; vestiture mostly pale yellowish on basal half of femur and on apical three-fourths of tibia; first tarsal with long pale yellow hairs on postero-dorsal surface, the remaining vestiture black. Wings slightly tinged with grey, semihyaline; veins black, the fourth vein pale in its last section.

Length.—Body, about 15 mm.; wing, 12 mm.

Newfoundland: Stephenville Bay, St. George, two females, August (Mus. Brooklyn Inst. Arts & Sci., access. 11,976); Deer Lake, May 10, 1901, female bred from *Rangifer terrænovæ* (A. Hassall).

Type.—Cat. No. 15,763, U. S. Nat. Mus.

Paratype deposited in Museum of Brooklyn Institute of Arts and Sciences.

The writer has had brought to his notice variation in the color of the pubescence of what is undoubtedly a single species of *Cephenomyia* at least as great as that here shown to exist between the new form and *Œdemagena tarandi*. It is therefore not without hesitation that he decided to characterize the new form as distinct. In this he was guided by the presence of slight structural differences, particularly in the shape of the eyes and frons. In *tarandi* the eyes are more elongate, while in *terrænovæ* they are more globose and extend but slightly below the antennæ; in *terræ-novæ* the frons is slightly narrower and more prominently rounded than in *tarandi*. The pile on the abdomen of *terrænovæ* is a trifle shorter than in the older species. An additional deciding factor was that in the numerous notices of *tarandi* there is no mention of color variation in the direction of the Newfoundland form here described. In the bred specimen the wings are not fully developed, but it is typical in other respects.

So far as I am aware the occurrence of *Œdemagena* in Newfoundland has been reported only once, by Prof. C. W. Johnson, on information from Mr. Owen Bryant (in Wilfred T. Grenfell's "Labrador, the country and the people," 1909, p. 431).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW BATS OF THE GENUS *TAPHOZOUS*.

BY N. HOLLISTER.

[Published by permission of the Secretary of the Smithsonian Institution.]

Two hitherto undescribed species of *Taphozous*, in the collection of the United States National Museum, may be known from the following descriptions:

Taphozous solifer sp. nov.

Type from Peking, China. Adult ♂, in alcohol, U. S. National Museum No. 113,010. Collected March 28, 1901, by M. L. Robb.

Diagnosis.—Size, proportions, and general characters of *Taphozous philippinensis*. Color quite different; upperparts with underfur drab instead of white, and with hair tips and general color much paler; lower underparts with hairs uniformly drab-gray, not bicolor.

Color from alcoholic specimens.—General color of upperparts wood-brown, the underfur drab and the hair tips wood-brown. Middle of throat, including beard and stripe under and back of ear, blackish. Cheeks, sides, and belly drab-gray, the hairs unicolor.

Skull and teeth.—Skull almost precisely as in *T. philippinensis*. Teeth slightly smaller, the mandibular rows noticeably narrower.

Measurements of type from alcoholic.—Head and body, 76; tail vertebræ, 21; hind foot, with claws, 12; forearm, 64. Skull of topotype: Condylobasal length, 19.4; zygomatic breadth, 12.5; breadth of braincase, 10.4; mastoid breadth, 10.9; interorbital breadth, 5.7; postorbital breadth, 4.8; upper tooth row, entire, 9.1; mandible, 16.4; mandibular tooth row, entire, 11.1.

Specimens examined.—Eight from the type locality, seven alcoholics and one skeleton.

Taphozous cavaticus sp. nov.

Type from Mocara Dua, near Emma-haven, south of Padang, West Sumatra. Adult ♀, skin and skull, U. S. National Museum No.

141,092. Collected January 15, 1905, by Dr. W. L. Abbott. Original No. 3944.

Diagnosis.—Like *Taphozous melanopogon*, but decidedly larger, with much larger skull. Lower lip more distinctly grooved above and in front.

Color.—Head, nape, and fore part of back, bister; posterior upperparts darker, slightly mixed with blackish-brown, the underfur everywhere broadly buffy-white. Throat and breast dark blackish-brown; belly and sides light drab, mottled with pale drab-gray, the underfur broadly buffy-white as on back.

Skull and teeth.—Skull like that of *Taphozous melanopogon*, but much larger, especially broader and with higher braincase. Teeth larger.

Measurements of type.—Head and body, 93; tail, 23; forearm, 65. The forearm of an adult ♀ topotype in alcohol measures 66.5. Skull of type: Condylobasal length (without premaxillary), 19.4; total length (without premaxillary), 20.6; zygomatic breadth, 13.3; breadth braincase, 10.6; mastoid breadth, 11.4; interorbital breadth, 6.0; postorbital breadth, 5.1; length upper tooth row, entire, 9.3; mandible, 16.2; mandibular tooth row, entire, 11.3.

Remarks.—Externally this species agrees with *T. melanopogon* in every character except the large size and the more pronounced lip grooves. Doctor Abbott has written in his field catalogue: "These two bats were brought me by a native who said he caught them in a large hole or cave in the rocks by the sea shore." The paratype is preserved in alcohol.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW CACOMISTLE FROM NEVADA.

BY GERRIT S. MILLER, JR.

[By permission of the Secretary of the Smithsonian Institution.]

A Cacomistle from the extreme south of Nevada, presented to the U. S. National Museum by Mr. Maximilian Weiss, differs so noticeably from the many other specimens previously in the collection that there seems little reason to doubt that it represents a peculiar local form.

Bassariscus astutus nevadensis subsp. nov.

Type.—Adult female (skin and skull) No. 174,760 U. S. National Museum. Collected in Eldorado Canyon, Clark Co., Nevada, January 8, 1912, by Maximilian Weiss. Presented by the collector.

Description.—Size less than in *Bassariscus astutus oregonus* from California and Oregon, the skull more like that of the Lower Californian *B. astutus palmarius;* teeth about as in the northern animal, therefore relatively and actually larger than in *palmarius;* color peculiar in the clear gray of head in front of ears, and in the reduction of the amount of buff in general tint of neck and anterior half of back, this entire region appearing more ashy than in any other adult specimen in fresh pelage seen; underparts pale cream buff behind fore legs, less pallid anteriorly.

Measurements.—Skin of type (approximate): head and body, 330; tail, 310; hind foot, 57 (55); condylobasal length of skull 72.4 (76.6);* zygomatic breadth, 43.4 (47.8); breadth of rostrum, over canines, 12.6 (13.0); interorbital constriction 15 ± (15.2); postorbital constriction, 14.8 (14.8); breadth of braincase, 32.8 (32.4); depth of braincase, 23.2 (24.8); mandible, 50.0 (53.4); maxillary toothrow exclusive of incisors, 30.2 (31.0); mandibular toothrow exclusive of incisors, 31.8 (32.8).

* Measurements in parenthesis are those of an adult female *B. a. oregonus* from Stillwater, Shasta Co., California (No. 108,763).

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PROCEEDINGS

OF THE

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NINE NEW THYSANOPTERA FROM THE UNITED STATES.

BY J. DOUGLAS HOOD,
Biological Survey.

The following species of thrips have not been heretofore described. One is of economic importance and all but two are represented by an abundance of material.

Scirtothrips niveus sp. nov.

Female.—Color almost white. Head about 1.5 times as wide as long, broadest across eyes; cheeks straight and parallel; eyes .6 as long as head, interval twice their breadth. Antennæ about 2.5 times as long as head; segment 3 pedicellate; segments 1 and 2 white; 3 white in basal half, shading to dark gray at tip; 4–8 dark gray, 4 pale at base, 5 pale just beyond the dark pedicel. Prothorax about 1.3 times as wide as long, minutely transversely striate; one short bristle at each posterior angle. Legs colorless. Wings three times the length of antennæ, and about 17 times as long as width at middle, colorless and almost perfectly transparent; anterior vein of fore wings with three nearly equidistant white bristles in distal half, posterior vein with two.

Measurements of holotype.—Length .99 mm.; head, length .090 mm., width .138 mm.; prothorax, length .120 mm., width .164 mm.; pterothorax, width .216 mm.; abdomen, width .232 mm. Antennal segments: 1, 19μ; 2, 36μ; 3, 42μ; 4, 36μ; 5, 33μ; 6, 41μ; 7, 8μ; 8, 14μ; total length of antenna, .23 mm.; width at segment 4, .018 mm.

Male.—Slenderer than female. Length .72 mm.

Described from eleven females and one male taken on the under surface of leaves of *Cornus florida* L., Plummer's Island, Maryland, May 18, 1913, by W. L. McAtee and the writer.

Thrips varipes sp. nov.

Female.—Allied to *madronii* Moulton. Color dark blackish brown. Head 1.3 times as wide as long, rather conspicuously cross striate; cheeks rounded; eyes .7 as wide as their interval. Antennæ slender, 2.4 times

as long as head; segment 1 lighter in color than head; 2 concolorous with head; 3 pale brownish yellow; 4 distinctly darker; 5–7 blackish brown. Prothorax about 1.2 times as long as head and nearly 1.5 times as wide as long; two long bristles at posterior angles, and between them three pairs of much shorter ones; notum spinose, with two bare areas. Legs blackish brown, with inner surfaces of fore tibiæ, both ends of middle and hind tibiæ, and all tarsi, yellow. Wings of fore pair dark grayish brown, nearly white in basal fourth; principal vein with three nearly equidistant bristles in apical half.

Measurements of holotype.—Length 1.27 mm.; head, length .120 mm., width, .157 mm.; prothorax, length .144 mm., width .212 mm.; mesothorax, width .300 mm.; abdomen, width .324 mm. Antennal segments: 1, 24μ; 2, 40μ; 3, 58μ; 4, 51μ; 5, 41μ; 6, 54μ; 7, 21μ; total length of antenna, .29 mm.; width at segment 4, .022.

Described from seventeen females as follows: Plummer's Island, Maryland, March 30 and April 6, 1913, in flowers of *Muscari racemosum* and *Erythronium* sp., W. L. McAtee and J. D. Hood, 11 females; Havana, Illinois, June 19, 1909, in flowers of *Clematis viorna*, C. A. Hart, 6 females.

Type locality.—Plummer's Island, Maryland.

Zygothrips harti sp. nov.

Female, macropterous.—Color fuscous to nearly black. Head about 1.2 times as long as wide; cheeks almost perfectly parallel, smooth; eyes slightly less than one-third as long as head; posterior ocelli in front of middle of eyes; postocular bristles capitate, three-fourths as long as eyes. Antennæ 1.7 times as long as head, nearly uniform dark blackish brown; segment 1 with base pale; 2 pale in outer apical half; 3 pale, darkened with brown along inner surface, indistinctly banded across apex and beyond pedicel; 4–8 blackish brown, 4 and 5 often pale at middle and toward outer surface; segment 7 *not broadly united to 8, the latter subconical, slender, and nearly three times as long as wide.* Prothorax about .7 as long as head and (inclusive of coxæ) about twice as wide as long; one pair of bristles at anterior angles and two at posterior angles, about as prominent as the postoculars and either blunt or capitate; midlaterals and anterior marginals minute. Fore tarsi unarmed. Wings slender, narrowed at middle, sparsely fringed and without interlocated subapical hairs; fore wings with a small spot of brown at base. Tube a little more than half as long as head, 1.7 times as long as basal width, and a little more than half as wide at apex as at base; terminal bristles twice as long as tube.

Measurements of holotype.—Length 1.09 mm.; head, length .156 mm., width .125 mm.; prothorax, length .107 mm., width (inclusive of coxæ) .204 mm.; pterothorax, width .209 mm.; abdomen, width .240 mm.; tube, length .084 mm., width at base .051 mm., at apex .027 mm. Antennal segments: 1, 25μ; 2, 36μ; 3, 35μ; 4, 33μ; 5, 12μ;

6, 39μ; 7, 34μ; 8, 28μ; total length of antenna, .266 mm.; width at segment 4, .025 mm.

Male, macropterous.—Length about .9 mm. Tarsal tooth wanting. Abdomen slender.

Described from nine females and four males, as follows: Loma, Texas, July 7, 1908, in sweepings, C. A. Hart, female and male (holotype and allotype); Grand Tower, Parker, and Pulaski, Illinois, May 29 to July 14, 1909, in sweepings from grass, C. A. Hart; Vienna, Virginia, May 25, 1913, on artichoke, J. D. H., one female; Cabin John, Maryland (near Washington, D. C.), June 8, 1913, in sweepings, J. D. H., one female.

Named in honor of Mr. Charles A. Hart, of the Illinois State Laboratory of Natural History, in recognition of his indefatigable field work on Thysanoptera.

Liothrips sambuci sp. nov.

Female.—Length about 2 mm. Color dark brown or black. Head about one and one-fourth times as long as wide; cheeks slightly converging to base; eyes about .36 as long as head; postocular bristles equal in length to eyes, nearly pointed. Antennæ less than twice as long as head; segments one and two nearly black, the latter paler toward apex; 3 clear orange yellow; 4 yellow, very slightly shaded on inner and outer surfaces; 5–8 nearly black, the pedicels of 5–7 pale gray. Prothorax .7 as long as head and (inclusive of coxæ) 2.1 times as wide as long; all bristles present, nearly pointed, dark in color. Legs black. Wings of fore pair with brown cloud in basal half of median third; posterior fringe double for 8 or 9 hairs. Abdomen moderately stout; tube about .8 as long as head and less than two and one-half times as long as width at base; all abdominal bristles nearly black.

Measurements of holotype.—Length 2 mm.; head, length .264 mm., width .208 mm.; prothorax, length .180 mm., width (inclusive of coxæ) .382 mm.; pterothorax, width .444 mm.; abdomen, width .516 mm.; tube, length .210 mm., width at base .087 mm., at apex .044 mm. Antennal segments: 1, 36μ; 2, 63μ; 3, 78μ; 4, 73μ; 5, 72μ; 6, 71μ; 7, 65μ; 8, 33μ; total length of antenna, .49 mm.; width at segment 4, .039 mm.

Described from one female taken on elder (*Sambucus canadensis* L.), at Laurel, Maryland, June 30, 1912, by E. B. Marshall.

Liothrips montanus sp. nov.

Female.—Allied to *umbripennis* Hood. Color dark brown or black. Head about 1.2 times as long as wide; cheeks rounded, converging to base; eyes not protruding, one-third as long as head, ventral interval about 1.5 times their width; postocular bristles blunt, equal in length to eye. Antennæ about twice as long as head; segments 1 and 2 nearly black, the latter paler toward apex; 3 clear orange yellow; 4–8 nearly

black, or with 4 yellow in basal third and along outer surface. Prothorax about .55 as long as head and (inclusive of coxæ) about 2.5 times as wide as long; all bristles present, blunt, dark in color. Legs black. Wings of fore pair dark brown in basal half; posterior fringe double for about 14 hairs. Abdomen moderately stout; tube about .8 as long as head; abdominal bristles nearly black.

Measurements of holotype.—Length 1.9 mm.; head, length .258 mm., width .216 mm.; prothorax, length (along median dorsal line) .144 mm., width (inclusive of coxæ) .360 mm.; pterothorax, width .420 mm.; abdomen, width .552 mm.; tube, length .204 mm., width at base .090 mm., at apex .038 mm. Antennal segments: 1, 33μ; 2, 60μ; 3, 81μ; 4, 78μ; 5, 78μ; 6, 75μ; 7, 62μ; 8, 36μ; total length of antenna, .50 mm.; width at segment 4, .039 mm.

Male.—Much like female in color and structure, but smaller and more slender.

Described from fourteen females and two males taken on currant and gooseberry at Bozeman, Montana (elevation 4,500 feet), June 8 and July 20, by Prof. R. A. Cooley and Mr. J. R. Parker. According to Professor Cooley, the species is of some economic importance.

Liothrips brevicornis sp. nov.

Female.—Allied to *citricornis* Hood. Color nearly black. Head about 1.4 times as long as greatest width; cheeks almost straight, converging to base; eyes not protruding, about .28 as long as head; postocular bristles equal in length to eyes, blunt. Antennæ about 1.6 times as long as head; segments 1 and 2 nearly black, the latter paler toward apex; 3 clear orange yellow; 4 brown, shaded with gray, darker on inner surface; 5–8 blackish brown, the pedicel of 5 paler. Prothorax about half as long as head and (inclusive of coxæ) 2.6 times as broad as long; all bristles present, blunt. Legs black. Wings of both pairs colorless; posterior fringe of fore wings double for 18–25 hairs. Abdomen broad and heavy; tube .8 as long as head and half as wide at apex as at base.

Measurements of holotype.—Length 2.04 mm.; head, length .336 mm., width .236 mm.; prothorax, length (along median dorsal line) .156 mm., width (inclusive of coxæ) .405 mm.; pterothorax, width .468 mm.; abdomen, width .552 mm.; tube, length .276 mm., width at base .090 mm., at apex .045 mm. Antennal segments: 1, 42μ; 2, 63μ; 3, 99μ; 4, 87μ; 5, 78μ; 6, 75μ; 7, 69μ; 8, 36μ; total length of antenna, .55 mm.; width at segment 4, .039 mm.

Described from several females taken by R. A. Cushman and the writer on *Sassafras sassafras* at Vienna, Virginia, in April and May, 1913.

Rhynchothrips (?) **salicarius** sp. nov.

Female, forma brachyptera.—Color coal black. Dorsal surface roughly sculptured, often with a deciduous whitish coating. Head about 1.1

times as long as wide; cheeks subparallel, slightly converging posteriorly, with several prominent spiniferous tubercles, of which one at anterior third is usually more conspicuous; two irregular carinæ between eyes; eyes about one-third as long as head, narrower than their interval; ocelli wanting; postocular bristles two-thirds as long as eyes, capitate. Antennæ about twice as long as head; segment 2 bent prominently outward at base of pedicel; segments 1 and 2 nearly black; 3 orange yellow; 4–8 blackish brown, the apical segments darkest, 4 yellow at base. Prothorax nearly as long as head, and (inclusive of coxæ) about 1.7 times as wide as long, without median chitinous thickening; all bristles present, short, capitate. Legs nearly black, short; tarsi brown. Wings short, scale-like. Abdomen broad and heavy, nearly one and one-half times as wide as prothorax; tube about equal in length to head, slightly more than twice as wide at base as at apex.

Measurements of holotype.—Length 1.8 mm.; head, length .204 mm., width .180 mm.; prothorax, length .192 mm., width (inclusive of coxæ) .342 mm.; pterothorax, width .360 mm.; abdomen, width .504 mm.; tube, length .192 mm., width at base .078 mm., at apex .035 mm. Antennal segments: 1, 42μ; 2, 60μ; 3, 45μ; 4, 51μ; 5, 48μ; 6, 52μ; 7, 54μ; 8, 43μ; total length of antenna, .39 mm.; width at segment 4, .035 mm.

Described from 101 females taken at the base of young willow shoots, Plummer's Island, Maryland, May 9, 18, and June 8, by W. L. McAtee, Alex. Wetmore, and the writer.

Phlœothrips ornatus sp. nov.

Female, forma macroptera.—Color mahogany brown, with a white vitta (broader posteriorly) each side of prothorax and with dorsum of abdominal segments 1–8 marked each with a lateral white blotch; base of prothorax, all of first abdominal segment, and intervals between dorsal and lateral pterothoracic plates often marked with white. Head 1.2 times as long as wide; cheeks nearly straight, slightly converging to base, finely striate, each with about five small spiniferous tubercles; eyes more than one-third as long as head, wider than their interval; postocular bristles minute, seemingly indistinguishable from the sparsely placed cephalic ones. Antennæ rather stout, 1.4 times as long as head; segments 1 and 2 nearly black; segments 3–8 blackish brown, pale at base. Prothorax a little more than half as long as head and only slightly broader than head; all bristles present, short, dilated at tip. Legs nearly black, with tarsi and ends of tibiæ pale grayish yellow. Wings of both pairs slender, not narrowed at middle; fore pair clear in basal third and at tip, intermediate portion clouded with gray, darkest along middle; posterior fringe double for 10 or 12 hairs. Tube about .6 as long as head and .6 as wide at apex as at base, sides straight; abdominal bristles mostly short and capitate.

Measurements of holotype.—Length 1.75 mm.; head, length .276 mm., width .228 mm.; prothorax, length .150 mm., width (inclusive of

coxæ) .276 mm.; pterothorax, width .336 mm.; abdomen, width .372 mm.; tube, length .156 mm., width at base .063 mm., at apex .038 mm. Antennal segments: 1, 27μ; 2, 54μ; 3, 63μ; 4, 65; 5, 51μ: 6, 53μ; 7, 43μ; 8, 37μ; total length of antenna, .39 mm.; width at segment 4, .036 mm.

Female, forma brachyptera.—Apparently identical with the long winged form, save for the absence of wings.

Described from many females, taken in May and June on the bark of a dying red-oak tree, Washington, D. C., by H. E. Burke, J. R. Malloch, and the writer.

Thrips winnemanæ sp. nov.

Female.—Color dull stramineous; pterothorax lightly shaded with orange. Head one and one-fourth times as wide as long; cheeks rounded; eyes slightly protruding, half as wide as their interval. Antennæ slender, 2.4 times as long as head; segment 3 about 3.3 times as long as wide; segment 1 nearly white; 2 concolorous with head; 3 pale in basal half, lightly shaded with grayish apically; 4 and 5 pale at base, dark brownish gray beyond; 6 and 7 dark brownish gray, the former sometimes pale at extreme base. Prothorax about 1.1 times as long as head and about 1.5 times as wide as long; two long bristles at posterior angles nearly black, and between them only two pairs of smaller ones, of which the outer is pale and almost invisible, the inner long, prominent, nearly black; two pairs of similar dark colored bristles near anterior angles, and one at middle of lateral margins; disk sparsely spinose. Legs uniform stramineous. Wings of fore pair very lightly shaded with gray; principal vein with three long, nearly equidistant bristles in apical half.

Measurements of holotype.—Length 1.18 mm.; head, length .124 mm., width .156 mm.; prothorax, length .139 mm., width .209 mm.; mesothorax, width .270 mm.; abdomen, width .300 mm. Antennal segments: 1, 27μ; 2, 42μ; 3, 60μ; 4, 51μ; 5, 45μ; 6, 57μ; 7, 21μ; total length of antenna, .300 mm., width at segment 4, .018 mm.

Described from two females taken in a flower of *Hydrophyllum virginicum*, Plummer's Island, Maryland, May 19, 1912, by W. L. McAtee and the writer.

Named for the type locality, supposed to have been known to the Indians as Winnemana.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW AFRICAN BIRDS.

BY JOHN C. PHILLIPS.

The two birds to be described were taken by Dr. G. M. Allen and the writer on a short collecting trip during the past winter up the Nile to Khartoum, and then up the Blue Nile and Dinder rivers in Semar. Most of the time was spent in the latter province, a region known ornithologically for a long time through the work of Heuglin and Rüppell.

Caprimulgus eleanorae sp. nov.

Type, adult ♀ M. C. Z. No. 63,436, taken at Fazogli, Blue Nile, Sudan, 15 January, 1913.

Description.—Most nearly like *C. monticolus* of India, of which it appears to be the African representative. In general color very much like the gray examples of *C. monticolus*, but at once distinguished by the spots on the three outer primaries, being small and round and confined wholly to the inner web, instead of being large and extending across both webs of 2d, 3d, and 4th primaries. In the new species the spot on the first primary is only 7 mm. in diameter, while on the third primary it is about 12 mm. Wing, 185 mm.; culmen to base of forehead, 28 mm.; exposed culmen, 11 mm.; tarsus, 20 mm. The characters of the male are unknown.

Remarks.—This species differs from all African species of somewhat similar general coloration by its much larger size, equal in fact to *C. monticola*.

Passer domesticus chephreni subsp. nov.

Type, adult ♂ M. C. Z. No. 63,594, from Gizeh, near Cairo, Egypt, December 12, 1912.

Description.—Like *P. d. indicus* but cheeks and ear coverts much darker (smoke grey, Ridgway, 1912) instead of whitish. Size similar to

indicus. Adult female very similar to *indicus* but cheeks darker and greyer.

Remarks.—Hartert (Vögel der Palaarktischen Fauna, Vol. I, p. 151), left this lower Nile race without a name, his material being insufficient, but in a footnote in the list of species to the first volume he refers the Egyptian bird to *niloticus* of Nicoll & Bonhote (Bull. B. O. club. XXII, P. 101).

P. d. niloticus is apparently a local desert race closely resembling *P. d. arboreus* from Khartoum, and not the typical sparrow of lower Egypt, which Nicoll & Bonhote still refer to *P. d. indicus*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PRELIMINARY DIAGNOSES OF APPARENTLY NEW BIRDS FROM TROPICAL AMERICA.

BY W. E. CLYDE TODD.

Since the publication of a paper by the writer entitled "Descriptions of Seventeen New Neotropical Birds" (Ann. Carnegie Mus., VIII, 1912, 198–214), the Carnegie Museum has received considerable new material from tropical America, while in addition four important families—Formicariidæ, Furnariidæ, Dendrocolaptidæ, and Trochilidæ—have been critically worked over, in all yielding a surprisingly large number of novelties. In order to make some of the results of these studies immediately available to ornithologists it has been thought best to publish brief diagnoses of the new forms at this time, leaving the detailed descriptions and critical notes to appear later in a series of more formal papers now in course of preparation.

For advice and assistance in making the necessary comparisons and in drawing up the descriptions the writer is much indebted to Mr. Harry C. Oberholser.

Catamenia oreophila sp. nov.

Adult female similar to the same sex of *Catamenia inornata minor* Berlepsch, but rump and upper tail-coverts dull grayish olive, almost concolor with the back, the latter with the dusky streaks less distinct; bill much smaller and more compressed; and tail relatively longer (60 mm.) and less emarginate.

Type, No. 37,723, Collection Carnegie Museum, adult female; San Lorenzo, Santa Marta, Colombia, June 11, 1911; M. A. Carriker, Jr.

Tanagra rufiventris colorata subsp. nov.

Similar to *Tanagra rufiventris rufiventris* (Vieillot), but yellow color of the sides of the breast more restricted, and lower breast (posterior to the

glossy blue-black area) much darker, more orange rufous, little paler than the abdomen.

Type, No. 38,400, Collection Carnegie Museum, adult male; Rio Turutu, Provence del Sara, Bolivia, September 4, 1910; José Steinbach.

Gymnostinops yuracares caurensis subsp. nov.

Colors in general darker than in *Gymnostinops yuracares yuracares* (D'Orbigny and Lafresnaye), and the bill decidedly weaker.

Type, No. 32,375, Collection Carnegie Museum, adult male; Rio Mocho, Rio Caura, Venezuela, November 29, 1909; M. A. Carriker, Jr.

Basileuterus auricapillus viridescens subsp. nov.

Similar to *Basileuterus auricapillus auricapillus* (Swainson), but paler and more greenish, less olive brownish above, and paler yellowish below, with less greenish suffusion on the flanks.

Type, No. 38,376, Collection Carnegie Museum, adult female; Buenavista, Provence del Sara, Bolivia, July 8, 1910; José Steinbach.

Hemispingus basilicus sp. nov.

Differs from all the other known species of this genus in having the head black, with a conspicuous median crown-stripe of pale grayish white, which is strongly tinged with citron yellow anteriorly; broad superciliary stripe, suborbital and postauricular patches, and middle of throat white or grayish white, the latter flecked with dusky; otherwise, about as in *H. atripileus* (Lafresnaye).

Type, No. 37,991, Collection Carnegie Museum, adult male; San Lorenzo, Santa Marta, Colombia, July 28, 1911; M. A. Carriker, Jr.

Pheugopedius genibarbis bolivianus subsp. nov.

Similar to *Pheugopedius genibarbis genibarbis* (Swainson), but more rufescent below, particularly on the posterior median portion, and somewhat duller rufous chestnut above.

Type, No. 38,224, Collection Carnegie Museum, adult male; Provence del Sara, Bolivia, October 12, 1909; José Steinbach.

Planesticus olivater sanctæ-martæ subsp. nov.

Similar to *Planesticus olivater olivater* (Lafresnaye), but size larger; upper parts darker, more olivaceous; under parts also darker, more brownish olive.

Type, No. 38,692, Collection Carnegie Museum, adult male; Cincinnati, Santa Marta, Colombia, April 12, 1912; M. A. Carriker, Jr.

Todirostrum schistaceiceps griseolum subsp. nov.

Differs from *Todirostrum schistaceiceps schistaceiceps* Sclater in its more grayish under parts, the greenish yellow on the sides, flanks, and under tail-coverts duller and more restricted.

Type, No. 36,292, Collection Carnegie Museum, adult male; El Hacha, Bolivar R. R., Venezuela, December 3, 1910; M. A. Carriker, Jr.

Rhynchocyclus flaviventris aurulentus subsp. nov.

Similar to *Rhynchocyclus flaviventris flaviventris* (Wied), but general coloration much brighter, more yellowish.

Type, No. 38,717, Collection Carnegie Museum, adult male; Mamotoco, Santa Marta, Colombia, April 19, 1912; M. A. Carriker, Jr.

Elænia boliviana sp. nov.

Above plain dull grayish olivaceous, the pileum slightly but distinctly crested, without concealed white patch; wings and tail clove brown, with grayish or olivaceous edgings, the former with the lesser, middle, and greater coverts tipped with whitish and the inner secondaries edged externally with the same color; throat pale grayish white, deepening into gray on the breast, and passing into pale yellow on the abdomen and under tail-coverts. Wing, 86 mm.; tail, 79 mm.

Type, No. 31,278, Collection Carnegie Museum, adult female; Puerto Suarez, Bolivia, December 7, 1908; José Steinbach.

Leptopogon amaurocephalus diversus subsp. nov.

Similar to *Leptopogon amaurocephalus amaurocephalus* Cabanis, but smaller, the back slightly darker green, the cap very much darker brown, the under surface paler yellow posteriorly, and the rectrices edged internally with buffy.

Type, No. 38,712, Collection Carnegie Museum, adult male; Mamotoco, Santa Marta, Colombia, April 19, 1912; M. A. Carriker, Jr.

Myiarchus (?) fortirostris sp. nov.

Nearest *Myiarchus ferox ferocior* Cabanis in general coloration, but paler and more greenish above, with the wing-edgings somewhat more prominent. Bill much paler and very differently shaped, however, being shorter, stouter, and relatively higher, with the culmen more rounded and the tip less strongly hooked.

Type, No. 38,222, Collection Carnegie Museum, adult male; Provence del Sara, Bolivia, October 18, 1909; José Steinbach.

Orodynastes striaticollis columbianus subsp. nov.

Similar to *Orodynastes striaticollis striaticollis* (Sclater), but more olivaceous, less fulvescent, brownish above, and the wings and tail darker, more blackish brown.

Type, No. 37,977, Collection Carnegie Museum, adult male; San Lorenzo, Santa Marta, Colombia, July 25, 1911; M. A. Carriker, Jr.

Microtriccus brunneicapillus dilutus subsp. nov.

Similar to *Microtriccus brunneicapillus brunneicapillus* (Lawrence), but decidedly duller and paler in general coloration.

Type, No. 34,605, Collection Carnegie Museum, adult male; Las Quignas, Venezuela, September 1, 1910; M. A. Carriker, Jr.

Thamnophilus doliatus heteroleucus subsp. nov.

Similar to *Thamnophilus doliatus fraterculus* Berlepsch and Hartert, but general coloration much whiter, the white bands being broader above, and white predominating below; white spots on the tail also very large and prominent.

Type, No. 36,625, Collection Carnegie Museum, adult male; Tocuyo, Venezuela, January 24, 1911; M. A. Carriker, Jr.

Ramphocænus melanurus pallidus subsp. nov.

Similar to *Ramphocænus melanurus trinitatis* Lesson, but much paler, nearly white, beneath, the sides and flanks very slightly shaded with buffy; upper parts less rufescent.

Type, No. 36,255, Collection Carnegie Museum, adult male; El Hacha, Bolivar R. R., Venezuela, November 30, 1910; M. A. Carriker, Jr.

Hypocnemis flavescens humilis subsp. nov.

Similar to *Hypocnemis flavescens flavescens* Sclater, but size smaller; outer margins of primaries and ground-color of back brighter gray; rump, tail, and inner remiges less rufescent; and breast less distinctly squamate.

Type, No. 32,108, Collection Carnegie Museum, adult male; La Lajita, Rio Caura, Venezuela, October 28, 1909; M. A. Carriker, Jr.

Myrmeciza zeledoni affinis subsp. nov.

The adult female differs from that of *Myrmeciza zeledoni zeledoni* Ridgway in being much paler and duller in general coloration.

Type, No. 36,804, Collection Carnegie Museum, adult female; Guarico, Estado Lara, Venezuela, February 6, 1911; M. A. Carriker, Jr.

Myrmeciza schistacea sp. nov.

Male almost uniform slaty above and below; wings and tail browner; wing-coverts black, tipped with white spots. Female mummy brown above, the head more dusky; below bright rufous brown, and the wing-coverts tipped with spots of the same color.

Type, No. 33,324, Collection Carnegie Museum, adult male; El Llagual, Caura District, Venezuela, January 13, 1910; M. A. Carriker, Jr.

Hylophylax consobrina sp. nov.

With a general resemblance to *Hylophylax nævia* (Gmelin), but breast not so densely streaked with black; back and tail tawny brown, the former with large buffy spots; feet pale.

Type, No. 32,380, Collection Carnegie Museum, adult male; Rio Mocho, Rio Caura, Venezuela, November 29, 1909; M. A. Carriker, Jr.

Sclateria nævia diaphora subsp. nov.

Similar to *Sclateria nævia nævia* (Gmelin), but darker below, the streaking reduced in extent; white spots on the wing-coverts smaller.

Type, No. 32,421, Collection Carnegie Museum, adult male; Rio Mocho, Rio Caura, Venezuela, December 2, 1909; M. A. Carriker, Jr.

Xenops genibarbis neglectus subsp. nov.

Similar in general to *Xenops genibarbis mexicanus* Sclater, but much paler, less rufescent throughout.

Type, No. 34,872, Collection Carnegie Museum, adult male; Las Quignas, Venezuela, September 22, 1910; M. A. Carriker, Jr.

Xenicopsis striolatus sp. nov.

Related to *Xenicopsis guttulatus* Sclater, but without distinct superciliaries; pileum distinctly streaked with buffy; and streaking on throat and sides of head not squamate.

Type, No. 37,105, Collection Carnegie Museum, adult female; Anzoategui, Estado Lara, Venezuela, March 2, 1911; M. A. Carriker, Jr.

Dendrocolaptes polyzonus sp. nov.

Differs from *Dendrocolaptes certhia certhia* (Boddaert) in being much darker and more rufescent brown, the pileum and hind neck with scarcely any indication of buffy or fulvous spotting, each feather being regularly barred (in concentric pattern) with dusky black.

Type, No. 38,380, Collection Carnegie Museum, adult; Provence del Sara, Bolivia, July 11, 1910; José Steinbach.

Picolaptes bivittatus certhiolus subsp. nov.

Similar to *Picolaptes bivittatus bivittatus* (Lichtenstein), but less suffused with buffy below; back and under wing-coverts less rufescent; and the superciliaries and streaks on the pileum paler, less buffy.

Type, No. 32,938, Collection Carnegie Museum, adult male; Curicke, Rio Grande, Bolivia, August 17, 1909; José Steinbach.

Phœthornis striigularis ignobilis subsp. nov.

Resembles *Phoethornis striigularis striigularis* Gould, but is paler below, the throat more uniform; rectrices with broader white edges and tips, the edgings of the outer rectrices more decidedly buffy; and the hind neck and rump paler cinnamomeous.

Type, No. 34,813, Collection Carnegie Museum, adult male; Las Quignas, Venezuela, September 19, 1910; M. A. Carriker, Jr.

Agyrtria hollandi sp. nov.

With a general resemblance to *Agyrtria milleri* (Bourcier), but crown bright blue (not greenish blue); under parts less extensively white; sides of the throat and breast prominently spangled with light blue; and upper parts much darker green.

Named for Dr. W. J. Holland, Director of the Carnegie Museum, in recognition of his interest in the acquisition of collections illustrating the neotropical avifauna.

Type, No. 33,938, Collection Carnegie Museum, adult male; El Dorado, Rio Cuyuni, Venezuela, April 16, 1910; M. A. Carriker, Jr.

Saucerottia tobaci monticola subsp. nov.

Differs from *Saucerottia tobaci feliciæ* (Lesson), in being darker, less bronzy green, in general coloration.

Type, No. 36,841, Collection Carnegie Museum, adult male; Guarico, Estado Lara, Venezuela, February 8, 1911; M. A. Carriker, Jr.

Metallura tyrianthina oreopola subsp. nov.

Similar to *Metallura tyrianthina tyrianthina* (Loddiges), but general coloration darker, and tail deep maroon purple, instead of bronzy or coppery.

Type, No. 37,217, Collection Carnegie Museum, adult male; Paramo de Rosas, Estado Lara, Venezuela, March 10, 1911; M. A. Carriker, Jr.

Microstilbon genus novum.

With the size and general characters of *Chætocercus* Gray, but tail of male very different, the two outer rectrices elongated (almost as long as the body), slightly expanded at the tips. Type, *Microstilbon insperatus* sp. nov.

Microstilbon insperatus sp. nov.

Above dark shining green; wings dusky; tail dusky or bronzy violaceous; below grayish, throat paler, whitish, spangled with green, and sides also more or less green. Wing, 26 mm.; tail, 30.5 mm.; culmen, 12.5 mm.

Type, No. 38,387, Collection Carnegie Museum, male (probably not quite adult); Buenavista, Provence del Sara, Bolivia, July 13, 1910; José Steinbach.

Electron platyrhynchum medianum subsp. nov.

Similar to *Electron platyrhynchum pyrrholæmum* Berlepsch and Stolzmann, but chin-spot more bluish and more conspicuous; posterior under parts and remiges somewhat less suffused with bluish; chestnut rufous areas slightly darker and duller.

Type, No. 38,346, Collection Carnegie Museum, adult female; Rio Turutu, Provence del Sara, Bolivia, August 11, 1910; José Steinbach.

Pyrrhura viridicata sp. nov.

Above green; wings externally bright blue; tail greenish above, coppery below; under surface mostly dull green; under wing-coverts orange; ear-coverts dull maroon; narrow frontlet scarlet.

Type, No. 37,987, Collection Carnegie Museum, adult male; San Lorenzo, Santa Marta, Colombia, July 27, 1911; M. A. Carriker, Jr.

Rallus longirostris leucophæus subsp. nov.

Above similar to *Rallus longirostris waynei* Brewster, but very different below, being almost white, with a slight wash of ochraceous buff on the breast. Very much paler and whiter below even than *Rallus longirostris coryi*.

Type, No. 39,717, Collection Carnegie Museum, adult male; Majagua River, Isle of Pines, November 7, 1912; Gustav A. Link.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW MOUSE OPOSSUMS FROM YUCATAN.

BY WILFRED H. OSGOOD.

Prof. Geo. F. Gaumer, who is so well known in connection with the natural history of Yucatan, has recently presented several interesting mouse opossums to the Field Museum of Natural History. As suspected by Prof. Gaumer, they prove to represent undescribed forms and are therefore named below, one of them fittingly being dedicated to its discoverer. Spanish descriptions of the same species will appear in Prof. Gaumer's work on the mammals of Yucatan soon to be published by the Department of Biological Survey of Mexico.

Marmosa gaumeri sp. nov.

Type from Yaxcaba, southwest of Chichen Itza, Yucatan, Mexico. No. 19,995 Field Museum of Natural History. Collected Nov., 1912, by G. F. Gaumer.

Characters.—Similar in general to *Marmosa canescens* of the Tehuantepec region, but decidedly smaller; coloration of upper parts suffused with fawn rather than buff; under parts pale creamy instead of buff. Upper parts dull brownish fawn finely and nearly uniformly mixed with dusky producing a general effect which approaches drab or broccoli brown; body color extending down outer sides of fore and hind legs nearly or quite to carpal and tarsal joints; feet creamy white; forehead and nose considerably paler than back; blackish brown eye-ring well developed but not reaching quite to the base of the whiskers anteriorly nor to the ear posteriorly; cheeks, inner sides of legs, and entire under parts pale creamy from the roots of the hairs; tail dull brownish drab above, paler below.

Skull much smaller than that of *M. canescens;* braincase small and narrow; nasals short and narrow, practically without any posterior expansion; postorbital processes and supraorbital shelf highly developed between marked anterior and posterior interorbital constrictions.

Measurements.—Type and additional specimen from Izamal, Yucatan,

measured in the flesh by the collector, respectively: Total length, 205, 217 (261);* head and body, 100, 105 (120); tail, 105, 112 (141); hind foot (estimated), 15, 16 (19.5). Skull of type: Greatest length, 30.4 (32.7); zygomatic breadth, 17.3 (18.9); anterior interorbital constriction, 4.3 (5); posterior interorbital constriction, 5.1 (6.1); width across postorbital processes, 6.9 (7.6); breadth of braincase, 11.4 (13); nasals, 12.3 x 2.8 (13.8 x 3.4); palate length from gnathion, 16.1 (17.6); front of canine to back of fourth upper molar, 11.75 (12.95); combined length of first, second, and third upper molars, 5.6 (5.8).

Remarks.—The disparity in size between this species and its nearest relative *Marmosa canescens* is such that, while intergradation is probable, it can not safely be assumed. The general grayish coloration is amply sufficient to distinguish *gaumeri* from *mayensis*, but there are also marked cranial differences, *gaumeri* having strongly developed postorbital processes set off by decided constrictions in front and behind, whereas *mayensis* has only slight suggestion of these characters. The nearly parallel-sided nasals of *gaumeri* also are distinctive.

Marmosa mayensis sp. nov.

Type from Izamal, Yucatan, Mexico. No. 19,994 Field Museum of Natural History. Collected March, 1913, by G. F. Gaumer.

Characters.—Similar to *Marmosa mexicana*, but paler in color, especially the under parts which are pale creamy white rather sharply defined from the color of the upper parts instead of deep ochraceous practically confluent with the color of the upper parts as in *mexicana*. General color of upper parts cinnamon with a fine almost imperceptible mixture of dusky; sides slightly paler than back and nearly clear cinnamon; eye ring intense black, extending posteriorly to anterior base of ear; under parts creamy white, the hairs self-colored except on the sides of the belly where they have slaty bases; feet white; tail drabbish brown above, scarcely paler below.

Skull practically as in *mexicana;* palate rather short and rostrum thickened; nasals moderately expanded posteriorly.

Measurements.—Total length, 228; head and body, 110; tail, 118; ear, 15.

Remarks.—*Marmosa mayensis* is the Yucatan representative of *M. mexicana* just as *M. gaumeri* is that of *M. canescens*. The pale creamy color of the under parts is widely different from the rich ochraceous buff of *mexicana*. *M. canescens* inhabits the rather arid region of the Isthmus of Tehuantepec while *M. mexicana* seems to be confined to more humid regions in Oaxaca and Vera Cruz. These two species have not been recorded from the same locality. Therefore, the occurrence of both *mayensis* and *gaumeri* at Izamal, well within the arid part of Yucatan, is of interest. Whether their local habits are identical or not might be investigated with profit.

* For convenience of comparison, the measurements of a topotype of *M. canescens*, kindly lent by the U. S. Biological Survey, are placed in parentheses after those of *gaumeri*.

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PROCEEDINGS

OF THE

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DESCRIPTION OF A COLLECTION OF UNSTALKED CRINOIDS MADE BY CAPTAIN SUENSON IN EASTERN ASIA.

BY AUSTIN HOBART CLARK.

From a zoögeographical point of view one of the most interesting of the present coast lines is that of Eastern Asia, from Cochin China northward. Although it was from this region that, two hundred and two years ago, the first crinoid outside of the two commonest European species was described (Petiver's *Stella Chinensis perlegens*) it is only within the last decade that our knowledge of the species inhabiting this area has emerged from the preliminary stage of widely scattered records, mostly accompanying descriptions of new species.

While a number of naturalists have gathered material in restricted localities, particularly in southern Japan, general collections covering the entire region, or any large part of it, have been extremely few—limited, in fact, to two, that of the U. S. Fisheries Steamer *Albatross*, and that of Captain Suenson.

Much of Captain Suenson's material has already been recorded (Vidensk. Medd. fra den naturhist. Forening i Köbenhavn, 1909, pp. 116–194); but since the publication of these records additional specimens have been received from him which, on account of their unusual interest, are well worthy of special mention.

Broadly speaking the crinoids of eastern Asia include species derived from four distinct faunal regions (1) the East Indian, (2) the southern Japanese, (3) the Arctic and (4) the Antarctic.

1. East Indian species, occurring in the Philippine Islands and on the coast of Cochin China, reach northward as far as Hong Kong, one of them possibly as far as Fuchow.

2. Southern Japanese species range from Tokyo Bay westward to the Korean Straits and thence southward along the Riu Kiu Islands to Formosa and Hong Kong, where they occur together with East Indian forms.

3. Arctic species inhabit the cold water which bathes the continental shores of the Sea of Japan, extending southward as far at least as the Korean Straits, possibly even to Shanghai.

4. Antarctic species inhabit the Pacific coast of Japan, and reach their southern limit at Tokyo and Sagami Bays.

From the coast of Asia between Cochin China and Korea we know 36 species of unstalked crinoids of which 17 may be regarded as East Indian, 15 as southern Japanese, and 2 as Arctic; one is of very general distribution throughout the eastern tropics, and one is doubtfully East Indian, being related to other species occurring in the Moluccas and at Tahiti. These species, with their ascertained range in this region, are:

FAMILY COMASTERIDÆ.*

Comatella stelligera (P. H. Carpenter) (E. I.).—?Chinese coast.
Capillaster macrobrachius (Hartlaub) (E. I.).—China Sea.
Capillaster multiradiata (Linné) (E. I.).—China Sea; Formosa (Taiwan).
Comatula solaris Lamarck (E. I.)—China Sea; Hong Kong.
Comaster gracilis (Hartlaub) (E. I.).—Pulo Edam, China Sea.
Comaster fruticosus A. H. Clark (E. I.).—East coast of China.
Comantheria imbricata (A. H. Clark) (J.).—Eastern Asia (probably Korean Straits).
Comantheria grandicalyx (P. H. Carpenter) (J.).—Canton; Fuchow.
Comanthus solaster (A. H. Clark) (J.).—Formosa Strait.
Comanthus japonica (J. Müller) (J.).—Hong Kong (see beyond).
Comanthus parvicirra (J. Müller) (G.).—China Sea; Pescadores Islands (near Formosa); Amoy.

FAMILY ZYGOMETRIDÆ.

Zygometra comata A. H. Clark (E. I.).—Hong Kong.
Catoptometra rubroflava (A. H. Clark) (J.).—Hong Kong (see beyond).

* The significance of the letters in parentheses after the specific names is as follows: E. I., a member of the East Indian fauna; J., a member of the southern Japanese fauna; Arc., a member of the Arctic fauna; G., generally distributed.

FAMILY HIMEROMETRIDÆ.

Amphimetra variipinna (P. H. Carpenter) (E. I.).—Canton.
Amphimetra sinensis (Hartlaub) (?E. I.).—Hong Kong.
Amphimetra laevipinna (P. H. Carpenter) (J.).—Canton.
Himerometra magnipinna A. H. Clark (E. I.).—Cochin China.
Craspedometra acuticirra (P. H. Carpenter) (E. I.).—Hong Kong.

FAMILY MARIAMETRIDÆ.

Mariametra subcarinata (A. H. Clark) (J.).—Formosa Strait.
Dichrometra döderleini (de Loriol) (J.).—Eastern Asia (probably Korean Straits).
Dichrometra flagellata (J. Müller) (E. I.).—Hong Kong (see beyond).
Lamprometra protectus (Lütken) (E. I.).—Pulo Condor, Cochin China; Hong Kong.

FAMILY COLOBOMETRIDÆ.

Cenometra abbotti (A. H. Clark) (E. I.).—Pulo Taya, China Sea.
Cenometra bella (Hartlaub) (E. I.).—North Watcher Island, Gulf of Tonkin.
Cyllometra albopurpurea A. H. Clark (J.).—Okinawashima, Riu Kiu Islands.
Decametra tigrina (A. H. Clark) (J.).—Eastern Asia (probably Korean Straits).
Oligometra serripinna (P. H. Carpenter) (E. I.).—Fuchow.

FAMILY TROPIOMETRIDÆ.

Tropiometra encrinus A. H. Clark (E. I.).—Eastern Asia.

FAMILY THALASSOMETRIDÆ.

Asterometra lepida A. H. Clark (J.).—Formosa Strait.
Stenometra dorsata A. H. Clark (J.).—Eastern Asia (probably Korean Straits).

FAMILY CHARITOMETRIDÆ.

Strotometra hepburniana (A. H. Clark) (J.).—Eastern Asia (probably Korean Straits.

FAMILY ANTEDONIDÆ.

Euantedon sinensis A. H. Clark (?E. I.).—?Chinese coast.
Compsometra serrata (A. H. Clark) (J.).—Formosa Strait.
Erythrometra ruber (A. H. Clark) (J.).—Eastern Asia (probably Korean Straits).
Heliometra maxima (A. H. Clark) (Arc.).—Eastern Asia (probably Korea).
Heliometra biarticulata A. H. Clark (Arc.).—?Shanghai.

The species represented in the collection recently received from Captain Suenson are the following:

FAMILY COMASTERIDÆ.

SUB-FAMILY COMASTERINÆ.

Comanthus japonica (J. Müller).

Locality.—Eight miles outside of Hong Kong harbor (22° 12′ N. lat., 114° 15′ E. long.); 14 fathoms; November 16, 1911.

Remarks.—The cirri of the single specimen collected are XXVIII, 31–34, 35 mm. to 40 mm. long; the segments in the outer half are broader than long, highly polished, and bear high sharp carinate processes. There are about forty arms 150 mm. long; all of the division series are 4 (3+4).

The right anterior ray of this individual is very abnormal; on the right II Br series (as viewed dorsally) the inner III Br series terminates in a doubled axillary—two axillaries side by side—forming an epizygal superposed upon the single hypozygal of the syzygial pair; each half of this doubled axillary gives off two arms so that four arms arise from this division series. Ventrally the ambulacral groove on reaching this axillary divides into three parts, one of which runs to the left (right as viewed dorsally) and soon divides, supplying two arms, while the other two run undivided to the two remaining arms. The left II Br series arising from this ray is undivided; it consists of only nine brachials of which the last bears a single terminal pinnule of large size; the structure tapers regularly from the axillary to the base of the terminal pinnule; the third and fourth brachials are united by syzygy so that this arm stump bears seven pinnules in all, six lateral on alternate sides of the arm and one terminal.

This specimen appears undoubtedly to be referable to *Comanthus japonica*, though the edges of the brachials and of the elements of the division series are less prominent than usual, and the cirri are rather longer and more slender than is ordinarily the case. It agrees well, however, with specimens at hand from various localities in southern Japan.

The small number of arms and the processes on the distal cirrus segments distinguish it from the variety of *Comanthus bennetti* occurring at St. Mathias Island (Proc. U. S. Nat. Mus., vol. **43**, 1912, p. 391) which is characterized by short outer cirrals. The much larger number of cirri, cirrus segments and arms readily distinguish it from the southern *Comanthus crassicirra* which represents *C. japonica* in the Moluccas.

FAMILY ZYGOMETRIDÆ.

Zygometra comata A. H. Clark.

Locality.—Eight miles outside of Hong Kong harbor (22° 12′ N. lat., 114° 15′ E. long.); 14 fathoms; November 16, 1911.

Remarks.—The better of the two specimens has the centro-dorsal discoidal, very slightly concave (almost flat) on the broad dorsal pole which is 5 mm. in diameter; the cirri are arranged in two irregular closely

crowded marginal rows, and are XXIX, 34–36, 20 mm. to 27 mm. long; the longest proximal cirrus segments are usually from one-third to one-half again as broad as long, and the outer cirrus segments are two and one-half or three times as broad as long; the eighth or ninth and following bear prominent, rather slender, dorsal spines which in the outer part of the cirri become more or less broadened laterally, forming short high transverse ridges or ending in a more or less completely bifurcated tip; toward the extremity of the cirrus the dorsal spines again resume their normal character. There are about thirty-eight arms about 90 mm. long; there are five II Br series of 4 (3+4) and four of 2; there are eleven III Br series of 4 (3+4), and four of 2; the single IV Br series is 4 (3+4); the radials, division series and arms are similar to those of specimens from Singapore.

The other specimen is similar; there are about forty arms; the ten II Br series are 4 (3+4); three of the III Br series are 2, the remainder being 4 (3+4); two IV Br series are present, one of 2 and one of 4 (3+4). The cirri are XXVIII, 33–35, about 25 mm. long.

Both specimens are dull pinkish with purple cirri, the earlier segments of the latter with white borders and a white dorsal surface.

Except for the greater number of arms these specimens agree perfectly with a series at hand from Singapore and from the Philippine Islands.

This species differs from the Australian *Zygometra elegans* in possessing fewer arms, greater regularity in the division series, smaller and shorter cirri which have fewer segments, and broader and less strongly rounded division series.

Catoptometra rubroflava (A. H. Clark).

Locality.—Eight miles outside of Hong Kong harbor (22° 12′ N. lat., 114° 15′ E. long.); 14 fathoms; November 16, 1911.

Remarks.—Five specimens were secured; the best of these has thirteen arms 100 mm. long; the three II Br series are 4 (3+4); the cirri are XXVII, 16–17, about 15 mm. long; the longest proximal cirrus segments are nearly or quite as long as the median dorsoventral diameter. A second specimen has twelve arms about 110 mm. long; the two II Br series are 4 (3+4); the cirri are XXVIII, 15, about 13 mm. long. A third has also twelve arms, the two II Br series being 4 (3+4); there are 14–16 cirrus segments. A small specimen has ten arms 60 mm. long. The fifth is much broken.

The color in life appears to have been bright yellow broadly banded with bright red, as in the type of the species.

These specimens agree well with the type and with other examples of *C. rubroflava* from southern Japan.

FAMILY MARIAMETRIDÆ.

Dichrometra flagellata (J. Müller).

Locality.—Eight miles outside of Hong Kong harbor (22° 12′ N. lat., 114° 15′ E. long.); 14 fathoms; November 16, 1911.

Remarks.—The single specimen, which agrees well with examples at hand from Singapore, has thirty-five arms 115 mm. long; the extra axillaries are all developed exteriorly; the cirri are XXII, 26–29, 15 mm. to 20 mm. long.

FAMILY COLOBOMETRIDÆ.

Oligometra serripinna (P. H. Carpenter).

Locality.—San Bernardino Strait, between Luzon and Samar, Philippine Islands (12° 27′ N. lat., 124° 03′ E. long.); 50–100 fathoms; bottom temperature 61° Fahrenheit.

Remarks.—One small specimen with arms 37 mm. long was secured at this locality.

FAMILY THALASSOMETRIDÆ.

Parametra orion (A. H. Clark).

Locality.—South of the Goto Islands (32° 25′ N. lat., 128° 52′ E. long.); 124 fathoms; bottom temperature 55° Fahrenheit.

Remarks.—The single example from this locality has fifteen arms 125 mm. long, and cirri XVIII 23–24, 21 mm. to 23 mm. long.

FAMILY ANTEDONIDÆ.

SUBFAMILY BATHYMETRINÆ.

Thaumatometra tenuis (A. H. Clark).

Locality.—Off northeastern Korea (41° 58′ N. lat., 130° 30′ E. long.); 620 fathoms.

Remarks.—One small specimen was secured at this locality.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BAT FROM THE EASTERN UNITED STATES.

BY E. W. NELSON.

The discovery of an undescribed species of bat from the Potomac River a few miles above Washington and from Vermont well illustrates our lack of knowledge concerning this group of mammals. It was first brought to my attention when Mr. George L. Kirk of Rutland, Vermont, sent me for identification two specimens collected April 10, 1913, in a cave near Brandon, Vermont, where he found a considerable colony of bats which had hibernated there during the preceding winter. One of these two specimens proved to be *Myotis lucifugus* and the other appears to represent the species here described. The collection of the U. S. National Museum, including that of the Biological Survey, was then examined and two other specimens representing the same species were discovered among the series of *Myotis lucifugus*, with which they had been confused. It appears to be uncommon since only these two could be found among the considerable number of specimens of the last named species from various parts of the Eastern United States in these collections.

Myotis winnemana sp. nov.

LEAST BROWN BAT.

Type from Plummers Island, Maryland (in Potomac River 10 miles above Washington): No. 150,275, adult ♂, U. S. National Museum, Biological Survey Collection; collected August 31, 1907, by Dr. A. K. Fisher.

Distribution.—Known only from type locality and Brandon, Vermont.

Description.—In general color closely resembles *M. lucifugus* but may be at once distinguished by its much shorter forearm and blackish muzzle. Color of upper parts dark rufous chestnut-brown with a tinge of golden; underparts dull grayish brown; muzzle and sides of head blackish as in

M. californicus; ears and feet similar in shape but distinctly shorter than in *M. lucifugus* and about as in *M. californicus ciliolabrum.*

Measurements of type (in flesh).—Total length, 82 mm.; tail, 39; hind foot, 8; forearm, 30.5; extent of wings, 225.

Skull.—Distinctly smaller and more flattened than in *M. lucifugus* and more closely resembling that of *M. californicus,* but even more flattened than in that species.

Skull measurements.—Basal length from nasal notch to occipital foramen, 10.4; width of brain case, 6.8.

Remarks.—The specimen from Brandon, Vermont, is a female and slightly more richly colored and larger than the male (type); this size difference between the sexes being commonly the case in this genus. It also differs from both the Maryland specimens in having a distinctly more flattened brain case and longer and proportionately heavier rostrum. Should other specimens from Vermont or the surrounding area agree with the Brandon example in the formation of the skull it may be necessary to distinguish it as a subspecies.

This interesting small species is most closely related to the *californicus* section of the genus but appears to have been overlooked up to the present time largely through its general color resemblance to *M. lucifugus.* It may be at once distinguished from that species by its forearm, which is about 4–8 mm. shorter. The skulls of this species are a trifle larger than those of typical *californicus,* from middle California, with top of brain case a little more flattened. They agree most closely in size and skull outline with examples of *M. californicus ciliolabrum* from South Dakota, and from Graybull, Wyoming, but have more flattened skulls and smaller teeth.

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PROCEEDINGS

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THE REMARKABLE LIFE-HISTORY OF A NEW FAMILY (*MICROMALTHIDÆ*) OF BEETLES.

BY HERBERT S. BARBER,

Bureau of Entomology, Washington, D. C.

During an attempt, still progressing, to secure by breeding all of the stages in the paedogenetic beetle, *Micromalthus debilis* Lec., certain astonishing facts have become evident which make the life-history of this beetle the most remarkable in the Coleoptera, if not one of the most remarkable in the whole class Insecta. Although still far from complete the publication of the life-history, as now known or foreseen, may cause students investigating other life-histories to look for hitherto unsuspected features in their problems, which if not really looked for, would pass unnoticed.

In a preliminary paper (Proc. Ent. Soc. Wash. 1913, vol. XV, pp. 31–38, plates II and III) the writer has illustrated the paedogenetic mother and young of this beetle, but the subsequent observations show that only a small part of the life-history was known at that time.

Micromalthus presents perhaps the most plastic larval forms yet known, combined with a practically fixed adult form of wide distribution. No close relatives are known, and it seems remarkable that specimens from Michigan, Kentucky and Virginia should exhibit no tendency towards local variation in a species apparently of such feeble powers of migration. It combines in its life cycle—eggs by two methods of reproduction, seven or eight forms of larvae, adults through two distinct lines of larvae, oviparous paedogenesis and viviparous paedogenesis. The species appears to present a beautiful case of sex-determina-

tion and this also seems to be an effective barrier against inbreeding; for males and females of the same brood appear unable to issue simultaneously on account of the interpolated larval stages of the former.

The breeding of the specimens is not difficult, except when too frequently disturbed. The larvae do not appear well able to readjust their surroundings after the gallery is opened, and the adherence of the skin to any smooth surface like glass has prevented their being kept in thin sections between microscope slides. Chips of wood kept in plaster cells have given best results, but the life-history must be pieced together out of disjointed observations and occasional thorough examinations of breeding material of known origin.

Beginning with the young larva born by the paedogenetic mother larva, we have a minute white larva principally conspicuous by its long, slender legs of the carabid type—*i. e.* coxa, trochanter, femur, tibia, *tarsus and two claws*. The remains of the mother are usually consumed by some of her young, after which all crawl away. This stage is to the species a minor migratory form, securing dispersal into new parts of the log in which the colony is living. After crawling out of the mother's cell the young wander for a time, then start burrowing into the wood again, feed a little and after a week or so moult into the second form which is legless and much resembles a Cerambycid larva, but for its odd but inconspicuous anal armature. A second or perhaps a third moult must occur in this form to allow for growth of head. The larva bores through the wood, packing its gallery tightly behind it with dust for some months, the body appearing dark colored from the food in the alimentary tract. During the latter part of this growth the eggs in the ovaries of what will be the paedogenetic form become plainly evident as large obliquely placed, oval, white bodies on each side of the distended and dark colored alimentary tract. When full fed it reverses its position in the gallery, makes a cell and begins to "aestivate." Gradually the body becomes white until no food is left in the alimentary tract. It then either, very rarely, pupates, or usually, moults, diselosing the paedogenetic form. After a period of about two weeks the young numbering from three or four, to thirty or forty, but usually about ten in number are born, tail first, and begin the new generation.

Certain individuals of the paedogenetic form, however, do not develop embryos, and of these many die apparently barren, but others void, through the vulva, instead of several migratory or "caraboid" young, a single large, soft, oval egg which adheres to the side of the mother and hatches in eight or ten days into a first stage larva utterly unlike the previous forms and which much resemble a weevil larva in appearance. This larva puts its head into the vulva of its mother and feeds on the contents of her body, growing rapidly and looking like the larva of a hymenopterous parasite. When full fed it changes into another form of larva having short, stumpy, three-jointed legs, and later pupates. It now appears that only male imagoes develop out of this metrophagous larva from the uni-oviparous paedogenetic form, and that only female imagoes develop direct from pupae out of the cerambicoid larvae.

According to common knowledge it is expected that the female after mating will lay eggs (few in number and of large size as in other paedogenetic species) which will hatch into first stage larvae (probably different from either of the other first stage larvae that have been mentioned), and that these will moult into feeding larvae that may or may not be the feeding larvae preceding the paedogenetic form. The whole may be better understood by combining the known and the unknown forms in a diagram. (See accompanying plate.)

It is believed that the observations on which the above scheme is based were on individuals behaving in their normal and regular manner; that males only are developed from the mother-devouring curculioid larva hatching from the single egg of the oviparous paedogenetic form, and that the amount of animal food taken by the young caraboid larvae in feeding after birth upon the body of their viviparous paedogenetic mother may govern the development of females or the oviparous paedogenetic form instead of viviparous paedogenetic individuals. Other factors, however, must of course play important parts and it is quite possible that a change of the wood to a dryer, warmer condition may force a majority of the developing brood of feeding larvae out as females.

The provision against inbreeding before alluded to as the series of interpolated larval stages of the male should be better explained. The cerambicoid larva, to produce a female, simply

changes to pupa and issue very shortly as adult ♀; while one that will produce a male must become in sequence:—uni-oviparous paedogenetic form,—egg,—curculioid 1st larva,—metrophagous larva,—short-legged prepupa,—pupa, and adult ♂. By this time all of his sisters will have lived their short lives and died.

A detailed account of one of the most significant series of observations in which the progeny of one paedogenetic mother developed to reproduce by all three methods above shown, may put the matter in a clearer light to the reader.

A colony of larvae was found in a pine log at Natural Bridge, Ky., in September, 1912, by Mr. T. E. Snyder, who gave some fragments of wood containing cerambicoid larvae to the writer on January 3, 1913. These were placed in a plaster cell and on February 8 the colony was found to be maturing into paedogenetic individuals. From these latter a number of isolations were made, and one large community cell was started of the progeny found in the cell of a paedogenetic mother whose shrunken body had probably been consumed by the young as has since been almost proven to be the rule. These twenty-one, first-stage, legged larvae were placed in a plaster cell in a tin box and supplied with food in the form of fragments of decaying wood from an oak stump in which the writer had failed to find evidences of this species. In an hour the larvae had all disappeared but later one was found dead with the fungus disease (?) that causes these larvae to turn pink, die, and then throw out fine radiating white filaments for nearly a millimeter in all directions. Some others probably died early. After two months some of the chips were broken up and larvae of about 3 mm. in length were found. Luckily, on July 1st, almost five months after starting the breeding cell the contents were carefully examined. Sixteen of the original twenty-one were found in the following conditions:

Seven were full-fed larvae, in two of which the paedogenetic form could be seen ready to moult.

Four were in the paedogenetic stage but did not display embryos within body and subsequently died (apparently barren).

Two were represented only by the cells in which the

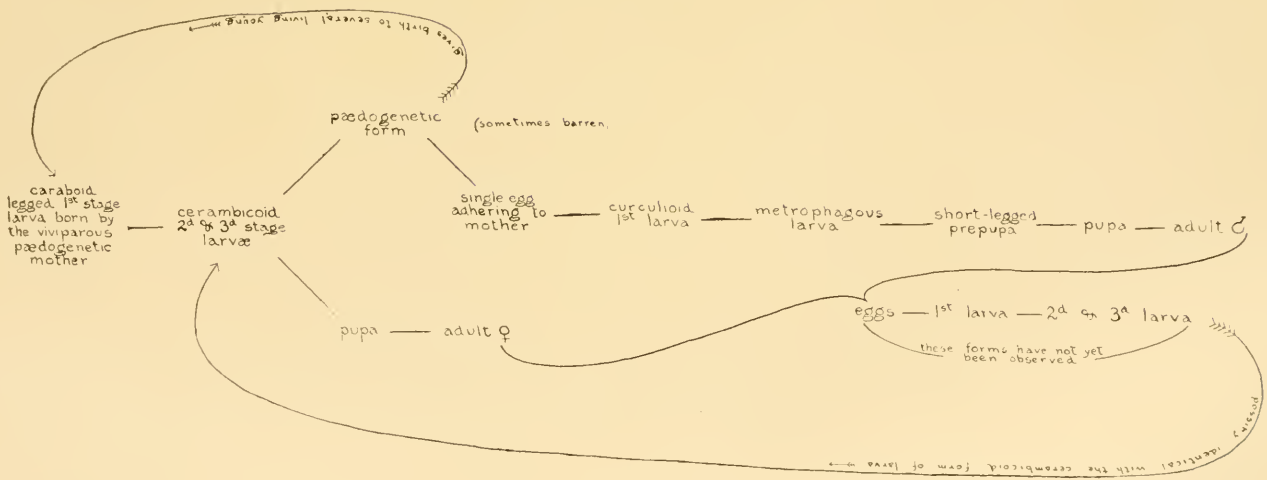

Diagram to illustrate the life-history of *Micromalthus debilis* Lec.

paedogenetic form had developed, given birth to young and been consumed by them; six young being in one cell and seven young in the other.

Two paedogenetic individuals had each laid an egg which was adhering to the side of the body.

One had transformed to the pupa of the adult ♀.

The cells of the pupa and one of the oviparous paedogenetic individuals were less than 3 mm. apart and in wood of the same character of decay, which fact would appear opposed to the idea of food differences controlling development unless early in their history.

Of the above, some were preserved, some died, the young were placed in new cells with pulverized wood to try to raise them. The pupa transformed to an adult female which lived about five days and died unmated. One of the two paedogenetic individuals with attached egg rubbed the egg free and the latter was lost in the wood debris; next day the other specimen had two adhering bodies—one egg and one young curculioid larva, the latter being in the position on the mother in which her first egg had been. The new egg may have been the one lost by the other reproductive individual, or may have been a second egg laid by the one who carried it. At any rate the first larva had the advantage, and the next day the rival egg had disappeared (supposed to have been eaten); the larva had its head in the vulva of the mother and was growing rapidly, feeding on the contents of her body, but later, when full-fed, became a victim of mould and died.

As stated in my former paper, this species should form the type of a new family, the *Micromalthidae*, abundantly distinct from the Lymexylonidae as is evident by the exceptions noted in LeConte and Horn's attempt to include it in that family in their "Classification" (Smithsonian Misc. Coll. 507, 1883, p. 231). The genus and species are well described by LeConte (Proc. Amer. Philos. Soc. XVII, 1878, p. 613) and as the family is monotypic, hardly more than the citation of the type genus is necessary. The feeble and ill-developed condition of the species was thought by LeConte to explain the simplification of structure and thus eliminate from consideration some of the structures used for classification. Hence, no doubt, the excep-

tions noted in the "Classification." To what extent it is proper to ignore or use for classification, characters developed by a species and by which it has adapted itself to a peculiar mode of life is a matter for much thought. Often the most obviously distinct characters are of recent development and trifling importance.

The family may, however, be temporarily characterized as follows:

Adults of small size, sexes similar, elongate, slender, depressed, feebly chitinized. Facies of a small *Hydnocera*. Head horizontal, wider than pronotum, narrower than humeri; eyes sub-globular, prominent; antennae widely separated, short, 11-jointed; joints 1 and 2 large, sub-globular; 3d and 4th small, globular; 5th to 10th gradually increasing in width and becoming transverse; 11th elongate, oval; mandibles strong, prominent, tridentate; maxillary palpi simple in both sexes, 4 jointed, last joint almost as long as preceding three; gula wide, indistinctly margined by externally arcuate lateral sutures. Prothorax shorter than head, side margins obsolete; prosternum not limited laterally, but transversely convex to dorsum, front margin straight, hind margin feebly arcuate between coxae which are open and contiguous; metasternum comprising about one-third the length of the body. Abdomen composed of 6 free ventral segments in the ♀, 7 in the ♂, of which the last is short and narrow. Legs short, tibiae with rather strong spine, 5th tarsal joint only a little shorter than the four preceding.

Male.—Antennae narrower, ventral abdominal segments 3, 4 and 5 with large median gland pore out of which project numerous hairs.

Female.—Antennal joints 5–11 wider; ventral abdominal segments 1 and 2, feebly chitinized; two anal processes acute, divergent and pointing downwards.

The writer hopes to give a complete account of the extraordinary life-history of this beetle at a later date.

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TWO NEW SUBSPECIES OF NORTH AMERICAN BEAVERS.

BY VERNON BAILEY.

In my report on the mammals of Texas* in 1905 I referred the beavers of the Rio Grande and Pecos rivers to *Castor canadensis frondator* Mearns. Since that time specimens have been collected at additional localities along the Rio Grande and its tributaries, and in working over the material in the Biological Survey collection from New Mexico I find that the beavers of the Rio Grande drainage differ so markedly and constantly from those of the Colorado drainage that it becomes necessary to provide a name for them. Other specimens from the Upper Peninsula of Michigan brought into the comparison of material also prove to be so different from typical *canadensis* that a subspecific name is required for them. These two forms show what appear to be the opposite extremes of pale desert coloration in those from the Rio Grande region and dark, rich coloration of those from the densely shaded forest area of northern Michigan. The cranial characters are also well marked.

Castor canadensis mexicanus subsp. nov.

RIO GRANDE BEAVER.

Type from Ruidoso Creek, six miles below Ruidoso, New Mexico, ♀ adult, No. 96,522, U. S. Nat. Mus., Biol. Survey Coll., collected by C. Barber, Sept. 29, 1899. Collector's number, 83 (Biol. Surv. X catalogue No. 1991).

General characters.—Size medium, colors dull and pale with very little chestnut at any season. Skull relatively short, wide and high.

* North American Fauna No. 25, Biological Survey of Texas, p. 124, 1905.

Color of type and 4 topotypes (Sept. 28 to Nov. 4): upper parts dull russet, brightest on crown, palest on cheeks and rump; ears dark brown like underfur of back; lower parts clear drab or dull buffy gray, overhair and underfur the same shade; sides and feet darker drab. Usually a trace of bright chestnut about the anus, and in the type and one topotype some chestnut on the hind feet. A topotype young of the year (Sept. 28) is slightly duller and darker than the adults. Two very small young (April 3 and 5) from the Rio Grande at Brownsville are practically the same color throughout as the adults, as is also a good specimen from Four Mile Run, Va., supposed to be one of the Brownsville beaver that escaped from the Washington Zoological Park. A half-grown specimen from Costilla River (an eastern affluent of the Rio Grande in northern New Mexico) taken August 23, is slightly darker and richer colored than the type and is evidently grading toward *canadensis* or *frondator*.

Cranial characters.—Compared with skulls of typical *canadensis* from York Factory and Oxford House, Manitoba, the skulls of this form are relatively short, wide and high, with more spreading zygomatic arches, shorter, wider nasals and rostrum, and higher, narrower occiput. Most of these characters are tending toward those of *frondator* and *texensis*, from both of which they differ however in details sufficient for ready recognition. From *frondator* the skull differs in heavier, deeper jugal, lower occiput and wider ex-occipital condyles. From *texensis* the skull differs in short, oval nasals, in narrower interorbital constriction and numerous other details.

Measurements.—Type, ♀ ad., total length, 1070; tail vertebrae, 400; hind foot, 174. Weight, 47 lbs. Ad. ♂ topotype (No. 96,525), 1020, 300, 180. *Skull* of type, condylobasal length, 136; zygomatic breadth, 101; length of nasals, 49; width of nasals, 25; mastoid breadth, 66; height of occiput, 40.3; alveolar length of upper molar series, 30.3.

Castor canadensis michiganensis subsp. nov.

WOODS BEAVER.

Type from Tahquamenaw River (five miles above falls), Luce Co., Michigan, ♀ adult, No. 170,561, U. S. Nat. Mus., Biol. Survey Coll., collected Sept. 20 by Clarence Birdseye. Collector's number, 1270.

General characters.—Size medium or small, colors very dark, ears and feet black; skull short and quadrate.

Color of type in early winter pelage: upperparts dark umber brown, brighter, almost mahogany brown on head and cheeks; ears and feet and nose black; lowerparts rather darker than upperparts, with blackish on breast and flanks. Quarter-grown young of same date and place duller and darker than type.

Skull relatively short and wide with abruptly spreading zygomatic arches; rostrum short and less tapering than in *canadensis;* nasals more quadrate, abruptly constricted posteriorly; occiput high and narrow

with upright occipital crest, giving a "sawed off" appearance to base of skull.

Measurements.—Type, ♀ ad., total length, 1170; tail vertebrae, 470; hind foot, 185 millimeters. *Skull* of type, condylobasal length, 129; zygomatic width, 96.4; length of nasals, 46; width of nasals, 24; mastoid breadth, 65; height of occiput, 39 (would be 41 but for unusual notch in basio-occipital); alveolar length of upper molar series, 29.4.

Weight of type, 58 lbs.

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A NEW DODECATHEON FROM NEW MEXICO.

BY PAUL C. STANDLEY.

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In a collection of plants from the Sandia Mountains of New Mexico, received recently from Miss Charlotte C. Ellis, is a specimen of what appears to be an undescribed species of Dodecatheon. Heretofore only a single member of this genus has been known from the State, *D. radicatum* Greene, the type of which was collected by Fendler in the mountains east of Santa Fe.

Miss Ellis has been an enthusiastic student of the New Mexican flora for several years and has collected a number of species either new or not previously reported from the State. *Primula ellisiae*, one of the most beautiful primroses of the Rocky Mountains, was described by Pollard and Cockerell* from specimens of her collection in the Sandia Mountains, as well as *Achillea laxiflora*, a most distinct species, known from only two collections.

Dodecatheon ellisiae Standley, sp. nov.

Perennial from a stout caudex about 7 mm. long; leaves few, the petioles 12 to 17 mm. long, dilated at the base; leaf-blades oblong to oblong-ovate, about 30 mm. long, 16 to 22 mm. wide, rounded at the apex, truncate or subcordate at the base, thin, glabrous, bright green, the margins undulate; scapes slender, 10 to 12 cm. high; bracts lance-oblong, 2.5 mm. long; flowers 2 to each scape (in the specimens examined); pedicels 8 to 27 mm. long; calyx 4 mm. long, the tube campanulate, the lobes short, triangular to broadly ovate, acute or acuminate; petals oblong, 8 to 10 mm. long, rounded at the apex, white, purple at the base; stamen tube obsolete; anthers 6 or 7 mm. long, purple, the

* Proc. Biol. Soc. Washington **15**: 178. 1902.

connective yellow; style slightly exceeding the stamens; capsules not seen.

Type in the U. S. National Herbarium, No. 692,082, collected in crevices of a cliff wet by trickling water, Capulin Canyon, Sandia Mountains, New Mexico, by Miss Charlotte C. Ellis (No. 330).

The only Rocky Mountain species to which this is allied is *D. multiflorum* Rydb., ranging in Colorado and Wyoming. That, however, is a much larger plant, with narrow, sinuate-denticulate leaves, long bracts, numerous flowers, narrow calyx lobes, and bluish violet petals. In the monograph of the genus by Pax and Knuth in Engler's Pflanzenreich,* following the key, the New Mexican plant would run to *D. latilobum* (A. Gray) Elmer. That species is restricted to Washington and Oregon and is at once distinguished from the one described here by the very large, broad, dentate-crenate leaves.

*22: 234–246. 1905.

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OF THE

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TWO NEW MURINE RODENTS FROM BALTISTAN.

BY GERRIT S. MILLER, JR.

[By permission of the Secretary of the Smithsonian Institution.]

Among the mammals which Dr. W. L. Abbott recently collected in Baltistan and presented to the United States National Museum are representatives of a vole and a rat belonging to undescribed forms.

Alticola glacialis sp. nov.

Type.—Adult female (skin and skull) No. 176,071 U. S. National Museum. Collected at Chogo Lungma Glacier (altitude 11,000 feet), Baltistan, August 23, 1912. Original No. 7841.

Diagnosis.—Like *Alticola montosus* * of central Kashmir, but tail not so long (usually 34 to 44 instead of 45 to 55) and color noticeably less brown.

Color.—Upperparts a moderately light gray with a faint brownish suffusion along back. The individual hairs are slate-color through the greater part of their length, then dull ivory-yellow (3 mm.), the tips black. Underparts between pallid-mouse-gray and white, the contrast with color of sides noticeable, but line of demarcation not sharply defined. Feet grayish white. Tail grayish white below, the upper surface brownish at tip, the dark area sometimes extending to base, but rarely as well defined as in average specimens of *A. montosus*.

Skull and teeth.—The skull and teeth resemble those of *Alticola montosus*.

Measurements.—Type: head and body, 116; tail, 40; hind foot (dry), 20 (18.6); condylobasal length of skull, 27.0 (26.8); † zygomatic breadth, 14.8 (15.0); interorbital constriction, 4.0 (4.0); occipital breadth, 12.8 (12.8); occipital depth, 7.0 (7.0); nasal, 8.0 (7.8); diastema, 8.0 (8.0); mandible, 17.2 (16.8); maxillary toothrow (alveoli), 6.6 (6.4); mandibular toothrow (alveoli), 6.4 (6.2).

* 1894. *Arvicola montosa* True, Proc. U. S. Nat. Mus., vol. 17, p. 11, May 8, 1894. (Central Kashmir, altitude 11,000 feet.)

1905. *Microtus imitator* Bonhote, Ann. and Mag. Nat. Hist., ser. 8, vol. 15, p. 197, February, 1905. (Tullian, Kashmir, altitude 11,000 feet.)

† Cranial measurements in parentheses are those of an adult female *Alticola montosus* from Min Nai, Kashmir (No. 173,701).

Specimens examined.—Forty-six, from the following localities in Baltistan: Basha Valley (12,000 feet), 11; Chogo Lungma Glacier (11,000 feet), 23; Tormik Valley (12,000 feet), 12.

Remarks.—As compared with *Alticola montosus*, represented by a series of 144 skins collected by Dr. Abbott in central and southern Kashmir, the Baltistan *Alticola* is readily distinguishable by its shorter tail and lighter color. In *A. montosus* the general appearance is that of an ordinary brownish vole, while in *A. glacialis* it begins to approach that of the characteristic members of the genus. The color is practically identical with that of *A. worthingtoni* of the Tian Shan Mountains, except that the tail is never entirely white.

Epimys rattus shigarus subsp. nov.

Type.—Adult male (skin and skull) No. 176,132 U. S. National Museum. Collected in the Shigar Valley (altitude 9,000 feet), Baltistan, October 4, 1912. Original No. 8010.

Diagnosis.—Like the member of the *Epimys rattus* group common in central Kashmir and currently regarded as identical with Hodgson's *Mus nitidus*, but color of upperparts paler and more grayish, and dark dorsal area of tail conspicuously sprinkled with white hairs.

Color.—Upperparts buffy gray, rather noticeably "lined" by the longer blackish hairs, the general effect more pallid than in *Epimys rattus nitidus* from Kashmir or *E. rattus alexandrinus* from Italy (which are essentially alike in color except that the tail is bicolor in *nitidus*, unicolor in *alexandrinus*); sides slightly paler than back. The elements of the color are: (*a*) neutral-gray underfur, (*b*) ivory-yellow tips to the shorter hairs, (*c*) blackish longer hairs, (*d*) whitish hair-like bristles, dark at tip. On flanks the yellowish element is less pallid, approaching more nearly to cream-buff or chamois. Underparts and dorsum of manus and pes ivory-yellow, the line of demarcation along sides of body not very well defined. Tail sparsely haired so that the scales are plainly visible everywhere except at tip, all the hairs white except on dorsal surface, where enough black hairs are intermingled to produce a rather noticeable dark area.

Skull and teeth.—The skull and teeth resemble those of *Epimys rattus nitidus* from Kashmir. As compared with that of Italian *E. rattus alexandrinus* the rostrum is more developed and the auditory bullae are less globularly inflated.

Measurements.—Type: head and body, 198; tail, 211; hind foot, 37 (35); condylobasal length of skull (teeth moderately worn), 42.6; zygomatic breadth, 22.0; interorbital constriction, 6.2; breadth of braincase, 16.4; depth of braincase, 11.2; nasal, 17.2; diastema, 12.2; mandible, 26.0; maxillary toothrow (alveoli), 7.0; mandibular toothrow (alveoli), 6.8.

Specimens examined.—Seven, all from the type locality.

Remarks.—This rat presents an example of the tendency shown by several Baltistan mammals, such as *Apodemus wardi* and *Alticola glacialis*, to be paler in color than their representatives from central and southern Kashmir.

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DESCRIPTIONS OF TWO NEW BIRDS FROM ALABAMA.

BY ARTHUR H. HOWELL.

Recent field work conducted by the Biological Survey in Alabama has resulted in the discovery of undescribed forms of the common crow and of the towhee. Both of these new forms reach the extreme of differentiation on the Gulf coast, the towhee ranging nearly throughout Alabama and the crow still farther north to southern Illinois and the District of Columbia. One interesting fact developed by these studies is that neither of the new races is closely related to the forms occupying peninsular Florida, nor are they strictly intermediate between the latter and the northern races of the species. The crow is decidedly smaller than the Florida Crow while the towhee is much larger than the Florida Towhee and slightly larger even than the northern race.

Corvus brachyrhynchos paulus subsp. nov.

SOUTHERN CROW.

Type from Bon Secour, Alabama. ♀ adult, No. 204,882, U. S. Nat. Mus., Biological Survey Collection. October 24, 1908, A. H. Howell. Orig. No. 741.

Characters.—Decidedly smaller than *Corvus b. brachyrhynchos*, with a much slenderer bill. Nearest to *Corvus b. hesperis* but with shorter wing and slightly larger bill.

Distribution.—Alabama, Mississippi, Louisiana, southeastern Texas, Georgia (?), South Carolina, and north to the District of Columbia and southern Illinois.

Measurements.—Type (♀ adult): wing, 273; tail, 165; exposed culmen, 46; depth of bill at nostrils, 16.5; tarsus, 54; middle toe, 34. Average of 4 adult males from Autaugaville, Alabama: wing, 290 (285–300); tail, 170 (166–178); exposed culmen, 51 (47–54); depth of bill at nostrils, 17.5 (17–18); tarsus, 60.5 (60–61); middle toe, 33.9 (31–36.5). Average of 3

adult females from coast of Alabama: wing, 274.3 (270–280); tail, 162.7 (155–168); exposed culmen, 45.8 (45.5–46); depth of bill at nostrils, 16.2 (16–16.5); tarsus, 57 (54–59); middle toe, 33 (32–34).

Remarks.—This new race of the common crow seems to be fully as well characterized as the other recognized subspecies. Although the bird is nearest to *C. b. hesperis* in size, its range apparently is separated from the range of *hesperis* by a strip of country in central Texas in which no crows breed. Specimens examined from east Texas are apparently intermediate between *brachyrhynchos* and *paulus*. A series of 9 breeding birds from the District of Columbia and vicinity are also somewhat intermediate, but much nearer to *paulus*. This form shows no approach to *pascuus*, the resident bird of south Florida, which has much larger bill and feet. A breeding male from Christchurch Parish, South Carolina, is typical *paulus* and a breeding female from Mt. Carmel, Illinois, is apparently nearest to this form.

Since *Corvus brachyrhynchos* has now been separated into five races, it seems desirable to fix the type locality of the original form. Brehm, in describing the species,* attributes it to North America, without mention of a definite locality. The measurements given by him (length, 19½ inches; tail, 8¼ inches; bill 23 lines) indicate a large bird and there is every probability that his specimen came from northeastern America. The large form is known to occur throughout New England and the type locality is hereby fixed at vicinity of Boston, Massachusetts.

Specimens examined.—Total number 24, from the following localities:

Alabama: Autaugaville, 6; Bayou La Batre, 1; Bon Secour, 1; Florence, 1; Whistler, 1.
Mississippi: Fayette, 1.
Louisiana: Tallulah, 1.
Texas, Sour Lake, 1.
South Carolina: Christchurch Parish, 1.
Virginia: Falls Church, 5; Addison, 1.
Maryland: Bladensburg, 1; Garrett Park, 1.
District of Columbia: Washington, 1.
Illinois: Mt. Carmel, 1.

* Beiträge zur Vögelkunde, II, 1822, pp. 37, 56.

Measurements of 23 Specimens of *Corvus brachyrhynchos paulus*.

Museum No.	Sex	Locality	Date	Wing	Tail	Culmen	Depth of bill at nostrils	Tarsus	Middle toe
230434	♂	Autaugaville, Alabama	September 17, 1911	288	170	53	17.5	61	36.5
230895	♂	" "	October 15, 1911	285	168	54	17.5	60	33
230946	♂	" "	November 5, 1911	289	166	50	18	60	31
230948	♂	" "	December 22, 1911	300	178	47	17	61	35
238189	♂	Florence, Alabama	May 7, 1912	301	178	49	18	58	31
239530	♂	Fayette, Mississippi	September 24, 1912	296	180	49	17.5	62	31
195909	♂	Sour Lake, Texas	March 20, 1905	298	181	55	18	67	36
193696	♂	Tallulah, Louisiana	February 25, 1904	289	169	53	17.5	64	36
222322	♂	Christchurch Parish, South Carolina	May 5, 1911	295	174	49	17	64	37.5
83914	♂	Fairfax County, Virginia	September 13, 1879	296	178	49	17.5	59	35
234161	♂	Falls Church, Virginia	May 7, 1913	295	176	53	17	61	36
234162	♂	" "	May 7, 1913	318	192	49	17.5	59	32.5
234163	♂	" "	May 7, 1913	287	166	48	18	58	32
240111	♂	Garrett Park, Maryland	June 13, 1913	298	170	46	17.5	56	35
204882	♀	Bon Secour, Alabama	October 24, 1908	273	165	46	16.5	54	34
230944	♀	Bayou La Batre, Alabama	February 9, 1912	270	155	45.5	16	58	33
230945	♀	Whistler, Alabama	March 11, 1912	280	168	46	16	59	32
230947	♀	Autaugaville, Alabama	January 5, 1912	286	166	48	16.5	62	34
230606	♀	" "	September 24, 1911	305	180	50	16.5	60	33
240174	♀	Bladensburg, Maryland	April 8, 1913	297	180	47	16	60	33
234164	♀	Falls Church, Virginia	May 7, 1913	303	180	43	16	60	32.5
239927	♀	Addison, Virginia	May 13, 1913	300	167	48	17	62	35
131508	♀	Washington, District of Columbia	May 9, 1892	298	186	48	17.5	60	36
83915	♀	Mt. Carmel, Ill.	April 13, 1869	297	181	45.5	17.5	57	33

TABLE OF COMPARATIVE MEASUREMENTS OF THE RACES OF *Corvus brachyrhynchos.**

Males	Wing	Tail	Exposed culmen	Depth of bill at nostrils	Tarsus	Middle toe
C. brachyrhynchos brachyrhynchos	321	182	51.5	19.5	62	38
" " pascuus	304	175	51.5	19	62.5	38
" " hesperis . . .	302.5	171	47.5	16.5	57.5	35.5
" " paulus † . . .	290	170	51	17.5	60	33.9
" " caurinus . . .	283.5	163	47	16.5	51	33
Females						
C. brachyrhynchos brachyrhynchos	305	177	48	18	57.5	35
" " pascuus	304	169	51	19	62	38
" " hesperis . . .	295	169.5	45.5	16	55.5	34
" " paulus ‡	283	167	47	16.3	59	33
" " caurinus . . .	272	153	45	16	48	30.5

Pipilo erythrophthalmus canaster subsp. nov.

ALABAMA TOWHEE.

Type from Spring Hill near Mobile, Alabama. ♀ adult, No. 207,771, U. S. Nat. Mus., Biological Survey Collection. May 8, 1911, A. H. Howell. Original No. 944.

Characters.—Similar to *P. e. erythrophthalmus*, but with larger bill and slightly longer tail; white markings on tail feathers less extensive; sides and flanks averaging paler; females with head, neck, chest, and upper parts more grayish (dark olive-brown instead of Prout's brown); iris red.

Distribution.—Greater part of Alabama excepting extreme northern counties where it grades into *erythrophthalmus;* eastern and western limits of range unknown.

Color.—Females: Upper parts varying from dark olive-brown to clove-brown; top of head somewhat browner (sepia or bistre); throat and chest pale fuscous, shading to bistre; otherwise as in *erythrophthalmus.*

Measurements.—Average of 8 adult males from Alabama: wing, 89 (85–93); tail, 97 (90–101); exposed culmen, 14.9 (14–16); depth of bill at base, 10.2 (10–11); tarsus, 29.9 (28–32) middle toe, 19.9 (19–21.5); length of white spot on outermost tail-feather, 28.7 (26–33). Female (type): wing, 86; tail, 96; exposed culmen, 14; depth of bill at base, 10.3; tarsus, 29; middle toe, 19; length of white spot on outermost tail-feather, 24.5.

Remarks.—This new race may be recognized in either sex by the relatively small amount of white on the tail, as compared with *erythrophthalmus,* and by the large size and red eyes as compared with *alleni.* Females are much more grayish than those of either *erythrophthalmus* or *alleni.* The bird is probably in the main non-migratory, and occurs locally in moderate numbers throughout Alabama and probably adjacent parts of Georgia and Mississippi.

* All measurements, except those of *paulus,* from Ridgway's "Birds of North and Middle America."

† Average of 4 adults from Autaugaville, Alabama.

‡ Average of 5 adults from southern Alabama.

Vol. XXVI, pp. 203–204 October 23, 1913

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SOME PLANTS FROM NEW MEXICO.

BY T. D. A. COCKERELL.

When in the Rito de los Frijoles, New Mexico, last year, I noticed a very beautiful Oenothera, not quite like anything I had seen. As it was too early to obtain seed, I brought home a small living plant in flower and put it in the garden. It produced a small amount of seed; but instead of dying, wintered over, and has this year grown to a great size and flowered profusely. It will yield enough seed to supply everyone interested in growing Oenothera, and will afford a new type to use in hybridization experiments. It seems, therefore, desirable to give it a name.

Oenothera hookeri hewetti subsp. nov.

Plant very large, spreading, about 4 feet high, and spreading $4\frac{1}{4}$ feet; stem and branches red, at full maturity the upper parts of the long branches, while closely beset with fruits, not appearing leafy, the bracts being reduced to less than the length of the capsules; leaves repand-denticulate, of the type of *O. hookeri*, only very sparsely pubescent, grayish-green; upper bracts much longer than fruits, apparently not deciduous; fruits as in the *biennis* group, but not contracted at apex, greyish, slightly speckled or streaked with red, finely pubescent, with scattered longer hairs intermixed; seeds angled; buds stout, distinctly 4-angled, colored with red, exactly as in *O. rubrinervis* as figured by Gates, Zeits. f. indukt. Abst. und Vererbungsl. 1911, IV, pl. VI, f. 4; sepals not separate when reflexed, the tips sometimes free as much as 10 mm.; branches tough and hard to break, not brittle as in *O. rubrinervis*: calyx tube in fully developed flower 37 mm. long; petals bright yellow, turning slightly reddish in fading; petals about 38 mm. long and 40 broad, not distinctly emarginate, though appearing so from folding in the opening flowers; total length of pistil 78 mm., extending about 13

mm. beyond the stamens and about 7 mm. beyond the petals. The tube of the calyx is of the same length as that of *O. rubrinervis*, but the sepals are about 6 mm. longer.

Abbott Ranch, Rito de los Frijoles, New Mexico, growing in a grove of *Populus angustifolia*, August, 1912 (*Cockerell*). Described from living plant in garden at Boulder, Colorado. Named after Dr. W. L. Hewett, the Director of the Archaeological work at the Rito de los Frijoles. It is evidently close to *O. irrigua* Wooton & Standley, but differs from the description, especially as to the pubescence. Mr. Paul C. Standley kindly informs me that it is very different from the typical form of *O. irrigua*. It is no doubt an "elementary species," and it may either be placed as a subspecies of *O. hookeri* or given a binomial as *Oenothera hewetti*.

Sedum cockerelli Britton.

Last August I collected living plants a few miles from the type locality, and now have them flowering in my garden. The characters "petals white, anthers pink," were given by Doctor Britton from my recollection. It now proves that the anthers are only slightly flecked with pink; it is the styles that are bright pink. The white petals have a transverse pink blotch near the middle. The plant is glabrous but scurfy. Stems light green; stem-leaves narrower at base than beyond, and not very acute.

Heliotropium xerophilum Cockerell.

In the new Illustrated Flora and elsewhere *H. spathulatum* Rydberg is given as a valid species, ranging to Chihuahua. It is, I am confident, *H. xerophilum*, described the year before. I think it is certain that there is only one species of the *H. curassavicum* group in New Mexico and Chihuahua.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE RELATIVE LENGTHS OF THE LARGE AND SMALL INTESTINES IN RODENTS.

BY T. D. A. COCKERELL, LEWIS I. MILLER AND MORRIS PRINTZ.

A few years ago Mr. John Gutberlet, working under the direction of one of us (Cockerell), made some interesting studies of the visceral anatomy of rodents, and among other things investigated the actual and relative lengths of the large and small intestines in different species, and different examples of the same species. The animals on which Mr. Gutberlet worked were kindly furnished by Mr. E. R. Warren, and the work is briefly referred to in The Mammals of Colorado, p. xx.

This year we have taken up the work afresh, and have considerably amplified and extended the earlier results. It has long been known that the length of the intestine in mammals varies greatly, and our facts therefore accord with those observed by others; but we have not been able to get over our surprise at the phenomenon. The alimentary canal is a part of the animal constantly in use, and essential for existence, and one would suppose that it would reach and be maintained at the optimum length. In man it is probable that the intestine is longer than necessary, but this is due to changes in food, resulting principally from the invention of cooking. In man, also, the superfluous parts of the canal cause disease and death, and except for the intervention of the surgeon, should be lessened through a process of selection.

It might be supposed that the differences observed were due to age, at least in part; but whenever we have found foetuses, the proportions of their intestines have agreed very closely with those of the mother. We have, however, only examined

foetuses of *Neotoma* and *Mus*. Parsons (Proc. Zool. Soc. Lond., 1898, p. 878) notes that the alimentary canal of foetal *Pedetes caffer* corresponds very accurately with that of its mother.

Mus musculus L.

All our material has been collected in Boulder. The maximum length of the small intestine is 49.8 cm., of the large 15; these measurements occurred in the same individual. About 40 cm. for the small and 9 for the large is more usual. The following figures represent the ratio of the large to the small intestine in the examples measured; the length of the small intestine is taken as 100, and that of the large is therefore expressed in percentages of it, decimals omitted. The numbers in parentheses refer to the number of individuals under each category. 15 (1); 17 (1); 18 (2); 19 (3); 20 (2); 21 (2); 22 (3); 23 (2); 25 (2); 26 (1); 27 (1); 30 (3); 31 (1); 33 (2); 34 (1). These figures suggest that larger numbers might give a distinctly bimodal curve.

In a female with ratio 100: 34, a foetus showed 100: 30. The following figures show the actual measurements of all the specimens having the small intestine over 40 or under 30 cm.; the first figure is that of the small, the second that of the large intestine. It certainly appears that the smaller mice have the large intestine proportionately somewhat longer (thus, the mice having the large intestine 30% or over the length of small, have small intestine of the following lengths, 28.9, 49.8, 39.4, 40.2, 33, 28, 28), but there is no regular correspondence. 45.2–8; 42.8–8; 49.8–15; 44–8.5; 45.5–8.8; 44.5–9; 42–9; 49.6–7; 43–9.5; 40.2–11.2; 40.2–12; 40.8–8.8. 28.9–9.9; 28–8.5; 28–9.

Epimys norvegicus (Erxl.)

All collected in Boulder. The ratio of the small to the large intestine is given in the same manner as above under *Mus*. 10 (1); 11 (1); 12 (1); 13 (5); 14 (2); 15 (2); 16 (2); 18 (2). Thus it appears that *Epimys norvegicus* differs conspicuously from *Mus musculus* in the proportions, although the extremes overlap; the series is also more compact, without any clear suggestion of a secondary mode.

The actual measurements (in cm.) are given in the same manner as those for *Mus*, for the individuals having the small intestine under 90 and over 100 cm.; 126–23; 125–8.5; 136–18; 114–13; 119–13; 111–14; 101.2–14; 103–17.8; 109–14.5; 104–14; 111.5–17; 72–12.6; 69–10.5. The last, giving the smallest measurements, is a male.

A well-marked example of the hooded rat, caught in Boulder, had a much longer large intestine than any of the normal rats, the measurements being 131–30. Is this racial, or an individual peculiarity?

Peromyscus boylii rowleyi (Allen).

Collected by E. R. Warren at Irwin's Ranch, Los Animas Co., Colorado. Ratios (given as under *Mus*): 58 (1); 59 (1); 60 (1); 64 (1); 67 (1); 69 (1). The small intestine varies from 21.3 to 25.5 cm.; the large from 14 to 15.2. There is thus little variation in the series, but probably material from other parts of the animal's range would show more. The proportions are entirely different from those of *Mus* and *Epimys*.

Peromyscus maniculatus rufinus (Merriam).

Collected by E. R. Warren at Medano Ranch, Costilla Co., Colorado, June 24, 1909. Ratios: 37 (2); 39 (1); 40 (1); 41 (1); 46 (1); 54 (1); 55 (1); 57 (1). The small intestine varies from 19 to 36 cm.; the large from 10 to 15. This is a more variable lot than the *rowleyi*, and the ratios are quite different. However, some *P. m. rufinus* collected at Boulder showed rather different figures, the actual measurements being 44.5–14; 35.8–14.21; 31–11. The variation here is still further away from *rowleyi*.

Cratogeomys castanops (Baird).

Mr. John Gutberlet has some interesting data on this species, which we hope he will eventually publish. It is the only one in which the large intestine was found to be longer than the small, the ratios (from Gutberlet's measurements) being: 103 (1); 125 (1); 126 (1); 140 (1); 143 (1); 146 (1). The small intestine varied from 34.3 to 47 cm.; the large from 48.3 to 61.

Perodipus montanus (Baird).

Collected by E. R. Warren at Medano Ranch and Hooper, Colorado. Ratios: 43 (1); 45 (1); 47 (1); 61 (1); 66 (1); 70 (1). Small intestine from 26.2 to 44 cm.; large from 17.4 to 21.2. A variable lot; the one with ratio 100 : 70 came from Medano Ranch. In this animal the right inferior lobe of the lung has no small pointed lobule beneath, such as is found in other genera examined by us.

The following measurements (in cm., the first figure the small intestine) relate to miscellaneous species, of which we possess only one or two specimens:

Fiber zibethicus cinnamominus Hollister (Boulder) . . 101–77.3.

Neotoma cinerea orolestes (Merriam) (Gregory Cañon) . 77–70.

Citellus grammurus (Say) (Boulder Cañon, 6000 ft., J. J. Blanchard) 146.5–58.

Eutamias operarius (Merriam) (Boulder Cañon) 51.3–25.4 and 65.7–36.1.

Eutamias quadrivittatus (Say) (Howard, Colo., E. R. Warren) . 67.5–39.

The ratios for the chipmunks are nearly the same, all falling between 50 and 58.

Onychomys melanophrys pallescens Merriam. (Hooper, Colo., E. R. Warren) . . 27.8–7.5, and one measured by Gutberlet . . 26.7–8.9.

Thomomys talpoides agrestis Merriam. (Gutberlet's measurements) 35.6–33.

The high ratio (about 93) indicates some approach to the condition of *Cratogeomys*.

The smallest ratio known to us is 100 : 9 for *Dasyprocta aguti*, based on the measurements by Prof. R. Jones, referred to by Mivart and Muric, Proc. Zool. Soc. Lond., June, 1866. That for *D. cristata*, as reported by these authors, would be about 100 : 22.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PARALLELISM IN MORPHOLOGICAL CHARACTERS AND PHYSIOLOGICAL CHARACTERISTICS IN SCOLYTOID BEETLES.

BY ANDREW D. HOPKINS.

Parallelism in morphological characters and physiological characteristics in the superfamily Scolytoidea relates to the occurrence of the same, or similar elements of structure, or the same kind of activity, in two or more species, genera, subfamilies or families.

Parallel species, genera and larger groups are those in which structure or habit is, in many respects, alike. Such species or groups may be closely allied, or more less widely separated.

Universal parallelism relates to repeated, or multiple origin, development and evolution of the same, or similar inorganic, or organic form, or activity.

This tendency towards parallel development appears to be in accordance with a fundamental principle, or law, *of parallelism in evolution*, under which, the origin and evolution of the same form or activity, under the same, or similar physical influences has been repeated many times, or in other words, that under similar environments, needs and requirements in nature, independent development and evolution, from a common base may produce repeatedly the same, or similar morphological and physiological results.

If this is true we should find evidences of it in any series of objects or activities which are the result of evolutionary processes. Scolytoid beetles have been selected as an example of such a series: 1st, because I have made a special study of them, 2nd, because my ideas of parallelism in nature are largely founded on the evidence they have furnished.

* Abstract of a Paper read before the Society November 29, 1913.

Morphological Characters.

The antennal club, eyes, head, thoracic segments, legs, wings, abdominal tergites and sternites, spiracles and stridulating accessories, present many examples of parallel modification in widely separated species, genera and families. The same is true of many elements of the secondary sexual characters and internal anatomy.

The antennal funicle is perhaps the most important taxonomic element of the Scolytoid beetles. It is one of the first things to look for as a guide to the combination of characters which distinguish the genus. While the same number of joints may be parallel many times in connected, or disconnected genera of the same subfamily, and in different subfamilies, there must be, as applied to these beetles, the same number of joints in all of the species of a genus.

In the 221 genera, representing 16 subfamilies, the number of joints in the funicle is paralleled as shown in the following table:

3	genera	representing	1	subfamily	have	1	joint.
6	"	"	2	subfamilies	"	2	joints.
13	"	"	4	"	"	3	"
44	"	"	7	"	"	4	"
73	"	"	9	"	"	5	"
31	"	"	9	"	"	6	"
51	"	"	9	"	"	7	"

The food, social and sexual habits, character of the brood galleries, choice of host plants and distribution of genera and species are all more or less rich in facts of taxonomic importance and parallel development.

In the social habits we find some features of special interest, both in their relation to taxonomy and to parallel lines of modification. In the relation of the sexes there is a wide range of difference and progressive modification from simple or unorganized, but intensive polygamy, towards a gradual reduction in the number of females and finally specialized monogamy. We have here a remarkable case of social evolution which in a like manner has been paralleled in that of the human species.

There is a wide variation in the types or forms of the egg and brood galleries within the families, subfamilies, the major

and minor groups and in some cases within the genus. The fact that there is a quite definite relation between the type of the gallery and the systematic position of the species, genus and group indicates that the evolution of the gallery has been from the simple to the complex *and that it has progressed with the evolution of the species which make and inhabit them*, in a similar manner to that of the evolution of human dwelling place from the simple cave to the modern palace.

The fact that the same or a similar type of gallery is formed by species of widely separated genera and subfamilies can not be so satisfactorily explained, on the theory of phylogeny, as it can on the theory of parallel evolution according to which two or more species, evolving along parallel lines, do things alike at like stages in the evolutionary process.

Thus we see that parallel modification in morphological and physiological elements is an important factor to be considered in taxonomy. It is evident from a comparative study of the various systems of classification that the failure of taxonomists to fully realize its importance has led to many erroneous conclusions and much confusion.

In conclusion, it seems to me that we have two fundamental questions to be answered in regard to the origin, evolution and classification of organisms.

1. Are the taxonomic characters and characteristics of the species, genus, family, order, class, and kingdom *the result of phylogenetic descent from a single ancestral nucleus, through natural selection and the inheritance of selected characters?* or

2. Are they *the result of phylogenetic descent from many nuclei through natural selection and natural parallelism?*

I am inclined to the belief that an affirmative answer to the second question would be more nearly in accordance with natural law.

While phylogenetic descent from a single source is represented by a single genealogical tree, parallelism from different sources may be represented by a forest of genealogical trees with their different elements as near alike as are the branches, leaves, flowers, and fruit of a forest of oak trees.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BAT FROM TONKIN.

BY GLOVER M. ALLEN.

Among a small collection of mammals lately acquired by the Museum of Comparative Zoölogy, is a specimen of the genus *Harpiocephalus* from Tonkin, eastern Indo-China, which I am unable to refer to any of the described forms. Mr. G. S. Miller, Jr., in 1907 (Bull. 57, U. S. Nat. Mus., 1907, p. 230), restricted the genus to include the single species *H. harpia* (Temminck) of India and the Malay region. The type locality of Temminck's *Vespertilio harpia* is Java, and through Mr. Miller's kindness I have been able to examine a fine skin and skull from Buitenzorg, obtained in 1909 by the Owen Bryant Expedition to Java. Compared with the Tonkin specimen this is a larger and much more brightly colored bat with the belly nearly gray instead of reddish. In their paper on mammals from Western Java, Messrs. Thomas and Wroughton (Proc. Zool. Soc. London, 1909, vol. 1, p. 380), record specimens from that island and remark that "the Himalayan form is obviously different by its darker and more chocolate colour. It should bear the name of" *H. lasiurus* (Hodgson), the type of which, from Dajiling, Nepal, is in the British Museum. They add that "Horsfield's *Lasiurus pearsoni*, also from Dajiling, would be a synonym of it." I have been unable to examine this species, but Hodgson describes it as "bright rusty above, sooty below, the hairs tipped with hoary." Apparently it is even larger than the Javan species as Jerdon (Mammals of India, 1874, p. 41) gives the forearm length 2¼ inches (57 mm.), though Dobson (Cat. Chiroptera, 1878, p. 282), in an alcoholic female from the Malabar coast found it but 2 inches (51 mm.), and Blanford (Fauna of

Brit. India, Mammals, 1889, p. 325) gives the same, adding that the lower surface of the body is gray in the Indian species. In its reddish under surface and smaller size the Tonkin specimen differs notably from the Indian and the Javan species, while the latter is much the brightest colored above, nearly cinnamon rufous of Ridgway (1886). Intergradation between the Indian and the Tonkin forms may be expected. The description of the latter follows:

Harpiocephalus rufulus, sp. nov.

Type.—Skin and skull No. 14206, M. C. Z., adult male from Lao-kai, Tonkin, collected January 3, 1912.

General Characters.—Smaller than *H. harpia* and *H. lasyurus;* duller red above than the former, the ventral part of the body of the same dull red as the back, not gray.

Description.—Pelage throughout of the cottony texture characteristic of the subfamily; forehead, top of head, and dorsal and ventral surface of the body clothed with long woolly hairs, the extreme bases of which are dark slaty, the middle three-fifths dull whitish or pale "smoke gray" (Ridgway, 1886), tipped with dull red, practically "walnut brown" of Ridgway; upper surface of tibia and interfemoral membrane thinly clad with long hairs of the same walnut brown tint. Chin and upper throat dull white. Forearms covered with short russet hairs.

Skull.—Compared with that of *H. harpia* from Java, the skull is strikingly smaller and more delicate, the interorbital region more markedly cylindrical as viewed from above, and the sagittal crest weaker. The teeth are essentially similar but slightly less massive. The inner upper incisor is in contact with the canine instead of being separated by a very slight space. The minute third upper molar is present on both sides.

Measurements.—No flesh measurements of the type were taken. The forearm measures 44 mm. (49 in the Javan specimen); thumb (bend of carpus to base of claw) 13; third finger, metacarpal 43.5 (48); first phalanx 18 (21); tibia and hind foot 29; foot 11. The figures in parenthesis are from the Javan specimen.

Skull: Condylobasal length 18.5 (19); palatal length 10.2 (11.2); interorbital constriction 5.7 (5.7); lachrymal breadth 7.4 (7.5); zygomatic breadth 13.2 (13.6); mastoid breadth 10.9 (11); upper cheek teeth (back of m^3 to front of canine) 6.4 (6.9); lower cheek teeth (back of m_3 to front of canine) 7.5 (8); point of union of lachrymal ridges to median intermaxillary notch 4.5 (5.4).

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PROCEEDINGS

OF THE

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THREE NEW SUBSPECIES OF GRASSHOPPER MICE.

BY N. HOLLISTER.

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Three hitherto unnamed forms of grasshopper mice, in the collection of the United States National Museum, are described below.

Onychomys torridus clarus subsp. nov.

Type from Keeler, Inyo County, California. U. S. National Museum (Biological Survey Collection), No. $\frac{2}{3}\frac{5}{2}\frac{4}{8}\frac{5}{6}\frac{3}{7}$, skin and skull of adult ♂ (teeth considerably worn). Collected December 30, 1890, by Vernon Bailey. Orig. No. 2314.

Diagnosis.—Like *Onychomys torridus longicaudus*, but clearer and brighter colored, with very little dark streaking above. Resembling *O. t. pulcher*, but much more intensely pinkish-cinnamon. Skull as in *longicaudus*, but with anterior palatine foramina averaging longer, reaching backward fully to line of fronts of first molars.

Color of adult in full winter coat: upperparts bright pinkish-cinnamon, palest on nose and head and most intense and glossy on lower back and rump, with very little or no darker admixture from the hair tips. Underfur dark neutral-gray; hairs with subapical band of buff, tipped with deep cinnamon. Ears very thinly haired, narrowly rimmed with brown; tufts at bases creamy-white, comparatively inconspicuous. Nose, cheeks, lower sides, limbs, hands, feet, and underparts, white, the underfur narrowly neutral-gray. Tail whitish, with narrow, indistinct stripe of grayish-brown along upper side for two-thirds its length.

Measurements of type.—Total length, 143 mm.; tail vertebræ, 51; hind foot, 20.5; ear from notch in dry skin, 15.7. Skull: Condylobasal length, 23.3; zygomatic breadth, 13.2; breadth of braincase, 11.6; maxillary tooth row, 3.7.

Onychomys leucogaster capitulatus subsp. nov.

Type from lower end of Prospect Valley, 4500 feet, Hualpai Indian Reservation, Grand Canyon, Arizona. U. S. National Museum (Biological Survey Collection), No. 202612, skin and skull of adult ♂ (teeth

moderately worn). Collected September 26, 1913, by E. A. Goldman. Orig. No. 22234.

Diagnosis.—Coloration much like that of *Onychomys leucogaster ruidosæ;* but size less, and skull considerably smaller and weaker. Darker than *O. l. melanophrys;* lighter, more reddish-brown, than *O. l. fuliginosus.*

Color.—The color, in all pelages, closely resembles that of *O. l. ruidosæ.*

Measurements of type.—Total length, 142; tail vertebræ, 43; hind foot, 21; ear from notch in dry skin, 14.6. Skull: Condylobasal length, 25.1; zygomatic breadth, 14; breadth of braincase, 13.0; maxillary tooth row, 4.3.

Onychomys leucogaster breviauritus subsp. nov.

Type from Fort Reno, Oklahoma. U. S. National Museum, No. $\frac{191441}{34872}$, skin and skull of adult ♀ (teeth moderately worn). Collected February 16, 1890, by Dr. J. C. Merrill. Orig. No. 18.

Diagnosis.—Most like *Onychomys leucogaster longipes,* but darker and richer colored, with shorter tail, smaller hind foot, and smaller ears.

Color of adult in full winter pelage: Head and back a rich blackish-brown, the ground color pinkish-cinnamon, the overlying hairs with long blackish tips which streak and darken the ground color; cheeks and sides with less of the dark streaking, the hips and lower rump almost pure pinkish-cinnamon. Center of nose gray; cinnamon spots at base of whiskers, between the gray of nose and white of lips. Ear tufts cinnamon-buff; tail grayish-brown above to near tip, sharply bicolor, the underside and tip white. Arms, hands, lower legs, and entire underparts white, with dark gray underfur everywhere except on chin.

Measurements of type.—Total length, 164; tail vertebræ, 42; hind foot, 21; ear from notch in dry skin, 13.2. Skull: Condylobasal length, 27.4; zygomatic breadth, 15.1; breadth of braincase, 12.5; maxillary tooth row, 4.7. Average measurement of ear from notch in dry skin in seven adults is 12.8; in twelve adults of *O. l. longipes,* 16.1.

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